U/C

House of Commons

International Development Committee

GLOBAL CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

Third Report of Session 2001–02

Volume II

HC 519–II

21502

INTERNATIONAL DEVELOPMENT SELECT COMMITTEE REPORTS IN THE CURRENT PARLIAMENT

Session 2001-2002

FIRST REPORT
The Humanitarian Crisis in Afghanistan and the Surrounding Region HC 300-I and II

FIRST SPECIAL REPORT
Government Response to the Committee's First Report of Session 2001-02 HC 633

SECOND REPORT
The Effectiveness of the Reforms of European Development Assistance HC 417-I and II

SECOND SPECIAL REPORT
Government Response to the Committee's Second Report of Session 2001-02 HC 1027

22501540623

House of Commons

International Development Committee

GLOBAL CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

Third Report of Session 2001–02

Volume II:
Minutes of Evidence and Appendices

Ordered by The House of Commons *to be printed 15 July 2002*

HC 519–II
Published on 23 July 2002 by authority of the House of Commons
London : The Stationery Office Limited
£18·50

WELLCOME LIBRARY
INFORMATION SERVICE
5 SEP 2002
DBC Hou/C

WELLCOME LIBRARY
M21502

INTERNATIONAL DEVELOPMENT COMMITTEE

The International Development Committee is appointed by the House of Commons to examine the expenditure, administration and policy of the Department for International Development and its associated public bodies.

Current Membership

Tony Baldry MP (*Conservative, Banbury*) (Chairman)
John Barrett MP (*Liberal Democrat, Edinburgh West*)
Mr John Battle MP (*Labour, Leeds West*)
Hugh Bayley MP (*Labour, City of York*)
Ann Clwyd MP (*Labour, Cynon Valley*)
Mr Tony Colman MP (*Labour, Putney*)
Mr Piara S Khabra MP (*Labour, Ealing Southall*)
Chris McCafferty MP (*Labour, Calder Valley*)
Mr Andrew Robathan MP (*Conservative, Blaby*)
Mr Robert Walter MP (*Conservative, North Dorset*)
Tony Worthington MP (*Labour, Clydebank and Milngavie*)

Mr Alistair Carmichael MP (*Liberal Democrat, Orkney and Shetland*) was also a member of the Committee during this inquiry.

Powers

The Committee is one of the departmental select committees, the powers of which are set out in the House of Commons Standing Orders, principally SO No. 152. These are available on the Internet via www.parliament.uk.

Publications

The Reports and evidence of the Committee are published by The Stationery Office by Order of the House. All publications of the Committee (including press notices) are on the Internet at www.parliament.uk/commons/selcom/indhome.htm.

Contacts

All correspondence should be addressed to The Clerk of the International Development Committee, Committee Office, 7 Millbank, London SW1P 3JA. The telephone number for general enquiries is: 020 7219 1223; the Committee's e-mail address is: indcom@parliament.uk.

LIST OF WITNESSES

Tuesday 15 January 2002

Mr Richard Manning, Director-General, Resources, Mr Andrew Bennett, Chief Natural Resources Adviser, and Mr Adrian Davis, Head, Environment Policy Department, Department for International Development, and Mr David Warrilow, Head of Science Policy, Global Atmosphere Division, Department for Environment, Food and Rural Affairs .... Ev 21

Tuesday 29 January 2002

Professor Martin Parry, Jackson Environment Institute, School of Environment Sciences, University of East Anglia, Professor Nigel Arnell, Department of Geography and Tyndall Centre for Climate Change Research, University of Southampton, Professor Robert Nicholls, Professor in Coastal Geomorphology and Management, Flood Hazard Research Centre, Middlesex University, Professor Andy Haines, Dean, and Ms Sari Kovats, Research Fellow, London School of Hygiene and Tropical Medicine .... Ev 51

Dr Neil Adger, School of Environmental Sciences and Tyndall Centre for Climate Change Research, University of East Anglia, and Dr Katrina Brown, School of Development Studies and Tyndall Centre for Climate Change Research, University of East Anglia .... Ev 63

Dr Benito Müller, Senior Research Fellow, Oxford Institute for Energy Studies, and Dr Saleemul Huq, Director, Climate Change Programme, International Institute for Environment and Development .... Ev 74

Tuesday 12 February 2002

Professor Ian Davis, Cranfield Disaster Management Centre, Miss Sarah La Trobe, Publicity Policy Officer, and Mr Andy Atkins, Director of Advocacy, Tearfund, Ms Madeleen Helmer, Development Officer, Climate Centre, Netherlands Red Cross, and Mr Jonathan Walter, Editor of the World Disasters Report .... Ev 94

Thursday 18 April 2002

The Rt. Hon. Clare Short, a Member of the House, Secretary of State for International Development, Mr Richard Manning, Director-General, Resources, and Mr Adrian Davis, Head, Environment Policy Department, Department for International Development .... Ev 111

LIST OF MEMORANDA INCLUDED IN THE MINUTES OF EVIDENCE

1. Department for International Development . . . . Ev 1, 35, 37, 121
2. Department for Environment, Food and Rural Affairs . . . . Ev 9, 35
3. Professor Martin Parry . . . . Ev 39, 40
4. Professor Nigel Arnell . . . . Ev 41
5. Professor Robert Nicholls . . . . Ev 46
6. London School of Hygiene and Tropical Medicine . . . . Ev 48
7. Tyndall Centre for Climate Change Research . . . . Ev 59, 67
8. Dr Benito Müller . . . . Ev 68
9. Dr Saleemul Huq . . . . Ev 69
10. Professor Ian Davis . . . . Ev 80
11. Tearfund . . . . Ev 82
12. Netherlands Red Cross . . . . Ev 93
13. Jonathan Walter . . . . Ev 110

LIST OF APPENDICES TO THE MINUTES OF EVIDENCE

1. British Bangladeshi Professional Association (BBPA) .... Ev 127

2. British Geological Survey .... Ev 131, 132

3. The Corner House .... Ev 135

4. The Green Globe Task Force .... Ev 139

5. Greenpeace UK .... Ev 140

6. Joint Nature Conservation Committee (JNCC) .... Ev 142

7. Intermediate Technology Development Group (ITDG) .... Ev 143

8. Royal Dutch/Shell Group of Companies .... Ev 145

9. Royal Society for the Protection of Birds (RSPB) .... Ev 147

10. Mr Peter Yeo .... Ev 149

11. Professor David Crichton .... Ev 150

12. Julie Ukeje, Assistant Director (Climate Services), Nigeria .... Ev 155

13. World Meteorological Organization .... Ev 163

MINUTES OF EVIDENCE

TAKEN BEFORE THE INTERNATIONAL DEVELOPMENT COMMITTEE

TUESDAY 15 JANUARY 2002

Members present:

Tony Baldry, in the Chair

Mr John Battle	Mr Piara S Khabra
Hugh Bayley	Mr Andrew Robathan
Mr Tony Colman	Tony Worthington

Memorandum submitted by the Department for International Development

EXECUTIVE SUMMARY

The memorandum considers why it has proved difficult to adequately account for environmental issues in the wider sustainable development debate; sets out the new thinking which links poverty reduction and actions to achieve the Millennium Development Goals with more sustainable use of environmental resources; and sets out in summary terms the likely impact of climate change, particularly on the poor in developing countries.

The memorandum concludes that incorporation of the environmental component of sustainable development is central to lasting poverty reduction; climate change is just one of many environmental factors that impact on the lives of poor people; and that continued uncertainty about its precise impacts indicates the need for pragmatic adaptation measures which respond positively to existing environmental pressures and climatic variability.

INTRODUCTION

1. The effects and impacts of climate change are a sub-set of the wider issue of the integration of environmental issues into the policies and programmes of DFID and its country partners, together with those of other bilateral and multilateral development agencies. The Globalisation White Paper contains an overall commitment to "equitable and environmentally sustainable growth". The challenge is to translate this into effective action on the ground.

ENVIRONMENTAL MAINSTREAMING

2. The UK definition of sustainable development is *"a better quality of life for everyone, now and for generations to come"*. Sustainable development is often interpreted as being only about the environment. We prefer to see it as taking account in a balanced way of social, economic and environmental aspects of development.

3. Within the totality of sustainable development, it is however true that environmental concerns are often marginalised in practice. The failure to adequately and appropriately incorporate environment into sustainable development reflects governance/institutional, market and policy failures:

(a) governance/institutional failures

— failures to integrate environment issues into poverty and development planning processes;

— corruption and lack of transparency by governments;

— weakness of environment ministries;

— lack of incentives for individuals and government departments to work across institutional boundaries to deal with cross-cutting issues such as the environment, particularly where they perceive this will make their life more complicated;

— the exclusive association of environment with environmental protection *per se*

(b) market failures

— insecure ownership of, or open access to, resources reduces the incentive to invest in their maintenance;

— externalities means that where a producer can shift the effects of pollution onto others, there is little incentive to limit the polluting activity;

— our knowledge of many ecological processes and of our effects on them is still weak and may never be fully reliable;

- the low level of public awareness in many countries means environmental impacts are often discounted;
- individuals generally have relatively short time horizons and pursue activities whose returns are higher in the short run, but lower in the long run, than more sustainable alternatives;
- some kinds of environmental damage are irreversible, but many decision-making processes undervalue the loss of options resulting from such a decision;
- more generally, the environment, and the goods and services it provides, is often viewed as being free.

(c) policy failures

- taxes and subsidies can prevent price signals from reflecting scarcity and the real value of environmental goods and services;
- poorly conceived interventions can exacerbate problems and create perverse incentives which encourage environmental degradation.

HOW TO RESPOND TO THESE FAILURES?

4. An evaluation published in mid-1999 concluded that, while avoiding direct negative environmental outcomes from its activities, DFID had failed to adequately incorporate environmental issues into its policies and programmes. Its main conclusion was *"There is a gap between the high policy priority attached by DFID to environmental issues, the value of projects marked as having environmental objectives, and what has actually been delivered in terms of positive environmental impact.... Environment as a potential development opportunity—rather than as a risk to be minimised and mitigated—has not fully been mainstreamed across the bilateral programme"*.

5. In response to these conclusions, DFID rethought its environmental agenda. DFID's over-arching objective is sustainable poverty reduction to which all activities should contribute. We therefore seek to clarify and give proper weight to the link between poverty reduction and the use of environmental resources. As set out in DFID's environment target strategy paper[1], we have examined the links between environment and the health, livelihoods and vulnerability of poor people. In broad terms, the agenda has moved from one which "does no harm to the environment" to one that "tries to do good", or one that looks to exploit environmental opportunities rather than to mitigate risks. The relationship in the three main areas is set out below.

(a) *Environment and health*

6. Environmental degradation influences the quality of life and economic opportunities for many people. While communicable diseases are the greatest source of morbidity and mortality for the poor, premature death and illness associated with environmental factors account for an estimated 20 per cent of the total burden of disease in developing countries. This exceeds the toll from malnutrition. Water-related diseases, caused by lack of access to clean water and adequate sanitation, claim an estimated three million lives each year mostly of children under five and exacerbate exposure to vector-borne diseases. Exposure to indoor air pollution, caused by burning poor quality or dirty fuels in inefficient stoves without proper ventilation, results in nearly two million deaths of women and children annually. Exposure to urban air pollution, primarily due to fine particles emitted by households that burn coal and other dirty fuels for heating and by two-stroke motorcycles and poorly maintained diesel vehicles, causes close to a million premature deaths and severe respiratory problems. Poor waste management can spread disease and is a source of poor water quality. Finally, exposure to agricultural and industrial chemicals and waste is a modern environmental health risk.

7. As with communicable diseases in general, this burden of disease falls disproportionately on the poorest. In both rural and urban areas, the poor are less likely to be served by water and sanitation infrastructure and are more likely to rely on dirty fuels for cooking. Urban air pollution affects all urban inhabitants, but the poor tend to suffer more severely because its effects are worse for those in poor health and because poor people have limited opportunities to protect themselves or to move to less polluted areas.

(b) *Threats to livelihoods*

8. Most rural households rely directly on the services of natural capital stocks such as ecosystems, water resources, land and soils, forests, and fisheries for their daily livelihood. As the availability of these resources decline and their quality deteriorates, livelihoods are threatened. There are three major threats to the livelihoods of rural households. Firstly, the overuse, mismanagement, and contamination of freshwater resources. Almost a third of the world's population faces water scarcity or stress. Rapid degradation of

---

[1] "Achieving sustainability: poverty elimination and the environment", DFID, October 2000.

wetlands and coastal zones is also a major environmental management problem, in part exacerbated by over-abstraction of water and by pollution. Pollution often results in poor surface and groundwater quality, on which people rely for drinking and other purposes. Secondly, soil degradation and erosion, often caused by the build-up of salts, poor irrigation and drainage, poor cultivation practices, deforestation and overgrazing. Such factors affect 30 per cent of the world's irrigated lands, 40 per cent of rain-fed agricultural lands, and 70 per cent of rangelands. Finally, the rapid depletion of forests, fisheries, and biodiversity, often as a consequence of unclear property rights, perverse economic incentives and poor governance. About 70 per cent of the world's fisheries are either depleted, overexploited, or fully exploited. Global rates of forest loss have reached alarmingly high levels. More than 20 per cent of the world's tropical forests have been cleared since 1960 and a much larger area significantly degraded.

(c) *Environment and vulnerability*

9. In 1992, Hurricane Andrew hit the US and caused 32 deaths. In the same year, a cyclone of similar intensity hit Bangladesh and caused 100,000 deaths. Poor people are particularly vulnerable to both natural disasters and changes in environmental conditions. Changing patterns of resource use have often undermined traditional arrangements for managing and sharing such natural risks as droughts, floods, fires, and earthquakes and responding to economic shocks which in a globalised world have far-reaching impacts. Pressures on resource stocks have prompted many poor households to live and work in vulnerable zones such as floodplains, drought-prone areas, or earthquake faults. Vulnerability is increased by specialisation in the use of particular natural resources, so that households have few alternatives when disaster strikes. Furthermore, the poor have less capacity to cope. Access to credit is more difficult than for better-off households, and the poor have fewer assets to sell or consume in times of hardship. Natural disasters, therefore, often have catastrophic effects on the poor.

10. The poor are also especially vulnerable to conflict, which can stem from environment-related reasons such as tension over access to, and control of, natural resources. This can occur at the global level (eg access to oil); at the regional level (access to water in the Middle East); at the national level (diamonds in Sierra Leone); and at a local level (access to wetlands and grazing lands on which the poor depend).

PRACTICAL POLICIES TO REDUCE POVERTY THROUGH ENVIRONMENTAL INTERVENTIONS

11. A lot of work has been carried out internationally on developing a framework for environmental policy interventions that can improve prospects for the poor. They are summarised in DFID's strategy paper and arise from joint work by UNDP and the EC in the first phase of their poverty-environment initiative. There are six main categories of intervention:

— strengthen participation by the poor in decisions on access to environmental resources and services through facilitating their participation in the preparation and implementation of national and local plans, policies and strategies;

— protect the current natural asset base of the poor through protecting the access the poor already have to critical resources—especially in cases where the poor are in a weak position to resist appropriation of these resources by other groups—and through protecting the environmental resources upon which the poor depend for their livelihoods;

— expand the natural asset base of the poor through transferring ownership of natural assets to the poor (such as the recognition of community forest law, the creation of community forest rights or rights to other resources) and promoting pro-poor land reform;

— co-manage and co-invest in environmental services and resources with the poor, through promoting and strengthening community management of environmental resources, and assisting the poor to overcome the high initial costs for receiving better quality environmental services (such as water supply and sanitation, renewable energy, improved domestic stoves and waste management);

— promote environmental services, infrastructure and technology that benefits the poor through a greater focus on quality and equitable delivery of services that impact most upon their health and livelihoods;

— make space for greater resource transfers to the poor through reducing subsidies for environmental services that benefit the non-poor (such as energy and water) and setting up mechanisms that allow the poor to be paid for environmental services they provide to other, often richer, groups.

12. There is general acceptance that these links exist. However, it is necessary to move one stage further. Clear guidance has to be developed on how these links can be incorporated in programmes and policy processes for more sustainable outcomes; and the relative importance of the environment among the

hierarchy of actions that can affect poverty. The issue of relative importance will have to be determined on a country by country basis, forming part of a wider process of analysis, debate and discussion in the country about policy options.

13. The links between poverty and environment need also to be looked at in relation to macroeconomic issues. In countries which are developing poverty reduction strategies, we have been trying to ensure that environmental issues are integrated into their formulation and implementation[2]. This also links in with the Millennium Development Goal which reads *"integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources"*. If poverty reduction strategies adequately integrate the environment and are developed in a participatory way, with strong country ownership and commitment, focusing on outcomes and means of implementation, then they and other planning processes can be a proxy for a sustainable development strategy. The label is not important.

14. Quantifying the costs of environmental degradation can also be a powerful advocacy tool to change attitudes in Finance, Planning and Energy Ministries in developing countries, where important policies and expenditure decisions are made and where environmental resources may still be considered a free good[3].

15. DFID has been instrumental (along with IBRD, UNDP and the EC) in establishing an international poverty-environment partnership, which has drawn in other bilateral and multilateral agencies. This partnership seeks to build on highly beneficial economies of both scale and influence in working together. In addition, the involvement of many donor agencies with poverty reduction strategies and their general desire to better coordinate donor support to the integration of environment into them is a further important objective. It will run for three years in the first instance. One of the main initial outputs will be a jointly authored paper on poverty and environment links which will be presented at a high level at the World Summit on Sustainable Development, to be held in Johannesburg in September 2002. The paper will seek to change the perceptions of the relationship between poverty and environment, and will therefore have a currency beyond the Summit. We have also committed £900,000 over the next three financial years to Phase II of the UNDP poverty-environment initiative, which will concentrate on work in developing countries to establish more evidence and practical actions in the relationship between poverty and environment.

The Importance of Climate Change

16. The first parts of the Memorandum have been a relatively lengthy introduction to the specific subject under scrutiny. This is because it is important to see climate change in the context of local environmental issues, and against the broader development problems (poverty, food security, health and education) to which many countries will understandably want to give emphasis.

17. Predictions about the impact and effect of climate change have recently been updated in the Third Assessment Report of the Inter-Governmental Panel on Climate Change (IPCC). The key conclusions are:

- In the period from 1990 to 2100, temperatures will rise between 1.4 to 5.8°C; sea levels are projected to rise between 8 and 88 cm; and the number of extreme weather events will increase, but by an amount that cannot be quantified;
- Projected changes in climate will have both beneficial and adverse effects on water resources, agriculture, natural ecosystems and human health, but the larger the changes in climate the more the adverse effects will dominate;
- Given existing high atmospheric greenhouse gas concentrations, climate change will continue to occur even if emission levels are significantly reduced from their current level.

18. The IPCC also made regional predictions of the effects of climate change. These are summarised in Annex 1.

19. The atmosphere is the quintessential global public good. It is immaterial from where a ton of CO_2 is released into the atmosphere. Its effect will be the same. Changes in climate can only be dealt with by an agreement which engages a sufficiently large proportion of the producers of greenhouse gases. Although this Memorandum does not propose to go into the detail of the international climate change negotiations[4], it is hugely important that near universal agreement has been achieved on the need for legal limits on greenhouse gas emissions.

20. However, from the perspective of the main decision makers in developing countries, climate change *per se* has not yet made much of an impact. There are a number of reasons for this. Firstly, the very long time horizons, when set against immediate exigencies, including conflict, HIV/AIDS and economic crises.

---

[2] The IBRD have been regularly reviewing poverty reduction strategies on the extent to which the environment has been integrated. Some improvement has been noted. See Annex II for the relevant publication.

[3] Some estimates that have been made of the costs of environmental degradation are 8 per cent of GDP in China; 2.3–4.6 per cent in Pakistan; 4–6 per cent in India; and 4–12 per cent from the degradation of natural resources alone in Uganda.

[4] DEFRA are submitting their own Memorandum.

Secondly, the lack of certainty on the relative importance of climate change as an issue, particularly uncertainty on the optimal timing of investment specifically to deal with climate change. Thirdly, the weakness of the institutional structure in many developing countries, where climate change is often led by meteorological offices, with a consequent emphasis on measurement and weather forecasting, rather than developing policies to deal with the longer-term issue of impacts, or mainstreaming these issues more generally within their respective governments.

21. However, the two main issues for developing countries are vulnerability and adaptation to climate change; and mitigation of greenhouse gas emissions.

(a) *Vulnerability and adaptation*

22. Experience over the past two decades suggests that vulnerability to extreme weather events has increased markedly. Reflecting in part the pattern of development itself, loss of life, displacement, and damage and destruction of natural, social and physical capital have all increased, and the losses are relatively greater for the poor in poorer countries. Climate change will increase the probability of greater rainfall and more extended dry periods, and the frequency and severity of droughts, floods and storm surges.

23. In looking at issues of vulnerability, it is vital to situate the response in the specific country, or local, context. Activities required for the enhancement of adaptive capacity are essentially equivalent to those promoting sustainable development. Adaptation and equity goals can be jointly pursued by initiatives that promote the welfare of the poorest members of society eg by improving food security, facilitating access to safe water and health care, and providing shelter and access to other resources. However, climate considerations have rarely been explicitly considered hitherto in public investment decisions. This is partly because of the current lack of knowledge makes it impossible to reliably predict the costs and benefits of adaptation. Much more research is required. As a particular response to this point, DFID has recently commissioned a piece of work to identify the likely impact of climate change on the achievement of the Millennium Development Goals. The first results, which will build on earlier work on modelling climate change, should be available towards the end of 2002.

24. Some broad areas of work to address these issues could include developing frameworks for incorporating climate risks in economic analyses; supporting specific vulnerability assessments; evaluating the longer-term consequences of disasters to increase awareness of the potentially serious threat that variations and changes in climate pose to sustainable development; and supporting pilot initiatives to promote community level activities aimed at, *inter alia*, reforestation, conservation and restoration of wetlands, protection of mangroves and coral reefs, and strengthening of local institutions to improve the capacity of poor people to cope.

25. One relevant proposal to come out of the Marrakech conference was that funds should be made available for least development countries to produce national adaptation programmes of action (NAPAs). These would provide the framework for developing countries to examine the adaptation needs and option. Specific guidelines have been developed with respect to the development of proposals for priority activities to address needs arising from the adverse effects of climate change. However, all our experience shows that NAPAs will not be successful if they are stand alone programmes: they must be fully considered in the context of a country's overall policies, programmes and priorities. Otherwise they will fare the same as the "enabling activities" of the environmental agreements, where evaluations have shown that there has been little practical achievement.

26. Policies, programmes and plans across all sectors—including agriculture, health and infrastructure—need to take into account the potential impacts of climate change. DFID is working in a number of countries, such as Bangladesh—a seriously affected country—to support ministries and officials understand the impact and identify appropriate responses. We anticipate extending this work to other countries, particularly those in sub-Saharan Africa where climate change is perhaps less dramatic but nevertheless has a considerable impact on livelihoods which are based largely on natural resources. We are also funding work to develop a practical and portable climate model designed to relate climate change to impacts at the appropriate planning level.

(b) *Mitigation of greenhouse gas (GHG) emissions*

27. The climate change negotiations are built on the concept of "common but differentiated responsibility". Based on their involvement in the UN Framework Convention on Climate Change, developing countries recognise the implications of global climate change and the need for all nations to assume responsibility for protecting the global atmosphere. However, because the contribution of developing countries to the GHG concentration has been small relative to the developed countries, and because of their urgency of their short-term needs of providing food, energy and other vital services for the poor, the Kyoto

Protocol imposes no restrictions on GHG emissions by developing countries. However, it is worth noting that should present trends continue, emissions from the developing world will overtake those from the developed world by 2015.

28. Many developing countries have been making big efforts to improve the energy efficiency of their economic growth. (This does not often happen, though it can make good economic sense to address energy efficiency). The most striking example is China, where the energy intensity of production has declined by about 35 per cent since 1985. This has been largely achieved by removing energy price subsidies, resulting in fiscal, global and local benefits (including significant so-called "ancillary benefits" in the form of reduced illness and pollution related damage). It also show the scope for reducing emissions on a "no regrets" basis ie by addressing market or institutional failures which are of immediate benefit in any case. The Clean Development Mechanism, introduced as part of the climate change negotiations, is also designed to help with mitigation while contributing to the sustainable development of developing countries.[5]

29. It is also clear that the volume of GHG emissions are highly dependent on the development pathway chosen. Significant technical progress in cost-effective, climate friendly technologies has been made in the past five years and at a faster rate than expected. Where these technologies are also economic, and compatible with the human capacity in developing countries, adopting them will obviously result in a development path which is much less energy intensive.

(c) *DFID and climate change*

30. As climate change issues are inextricably linked with the overall objectives of projects and programmes funded by DFID, it is impossible to use the normal statistical tools to assess the value of resources used to support climate change. We therefore appointed a consultancy firm to go through all our projects that might have had a climate change component. They reviewed 604 projects over the period 1997–98 to 1999–00. The results of the study showed that around £201 million over the three year period could be attributed to climate change activities. Projects which were examined included projects labelled as sustainable agriculture, biodiversity, sustainable forest management, energy efficiency, desertification, and water and sanitation. By far the largest recipient was India where the climate change commitment values of projects scored totalled £164 million.

(d) *The role of the Global Environment Facility (GEF)*

31. The GEF provides grants and concessional funds to cover the additional costs incurred when a development project or programme also targets global environmental objectives in four focal areas, including climate change. The GEF was established in 1991, it has allocated $3.4 billion to projects and programmes, of which around $1.3 billion has been allocated to climate change. Disbursements for climate change stand at $386 million as at June 2001. GEF climate change projects are organized into four areas: removing barriers to energy efficiency and energy conservation; promoting the adoption of renewable energy by removing barriers and reducing implementation costs; reducing the long-term costs of low greenhouse gas emitting energy technologies; and supporting the development of sustainable transport.

32. The UK has been a strong supporter of the GEF, having provided around £215 million since its inception. Negotiations are currently under way for the third replenishment of the GEF, to cover the period 2002–06. The UK has called for a 50 per cent increase in the funds available from $2 to $3 billion. Negotiations are likely to be completed by April 2002.

(e) *Other international players*

33. Many other international organisations and agencies are also active in this area. The World Bank has recently established a Vulnerability and Adaptation Group. UNDP is in the process of developing its own climate change and adaptation programme of action and many other bilateral donors are developing similar programmes. We intend to work closely with others to share knowledge and experience and to encourage a wider understanding of climate change and its links with poverty reduction.

---

[5] The CDM will be covered in detail in the DEFRA Memorandum.

CONCLUSIONS

34. For development to be sustainable, environmental considerations, along with economic and social ones, need to be integrated into overall country policies and programmes. This applies as much to developed, as to developing, countries. For DFID, the key is the extent to which the integration of the environment can contribute to sustainable poverty reduction. The Memorandum sets out how we believe this can be done. We recognise that climate change, while important, is only one factor in the set of environmental opportunities and risks.

35. Up to now, the actual and potential impacts of climate change have been marginal to the development agenda. The most important way to bring this to the attention of policy makers in developing countries is to focus on vulnerability and adaptation, as well as the mitigation of emissions (although it makes good economic sense for growth strategies to address the efficient use of energy resources). But it is vital that adaptation is not treated as a discrete activity. Any particular development option, and set of policies intended to influence the structure of economic development, will influence climate change. The reverse is also true: climate change will influence development options. Identifying and capturing synergies for both policy areas should lead to better, more resilient and sustainable economic development, more secure livelihoods and to more effective action to address climate change.

Annex 1

The International Panel on Climate Change (IPCC) made the following regional predictions:

Region	*Adaptive capacity, vulnerability and key concerns*
Africa	— Adaptive capacity of human systems is low due to lack of economic resources and technology, and vulnerability high as a result of heavy reliance on rain-fed agriculture, frequent droughts and floods, and poverty. — Grain yields are projected to decrease for many scenarios, diminishing food security, particularly in small food importing countries. — Major rivers are highly sensitive to climate variation; average runoff and water availability would decrease in Mediterranean and southern countries of Africa. — Extension of ranges of infectious disease vectors would adversely affect human health. — Desertification would be exacerbated by reductions in average annual rainfall, runoff, and soil moisture, especially in southern, North and West Africa. — Increase in droughts, floods and other extreme events would constrain development. — Coastal settlements, in for example, the Gulf of Guinea, Senegal, Gambia, Egypt, and along the East-Southern African coast would be adversely impacted by sea-level rise through inundation and coastal erosion.
Asia	— Adaptive capacity of human systems is low and vulnerability high in the developing countries of Asia; the developed countries of Asia are more able to adapt and less vulnerable. — Extreme events have increased in temperate and tropical Asia, including floods, droughts, forest fires, and tropical cyclones. — Decreasing agricultural productivity and aquaculture due to thermal and water stress, sea-level rise, floods and droughts, and tropical cyclones would diminish food security in many countries of arid, tropical, and temperate Asia; agriculture would expand and increase in productivity in northern areas. — Runoff and water availability may decrease in arid and semi-arid Asia but increase in northern Asia. — Human health would be threatened by possible increased exposure to vector-borne diseases and heat stress in parts of Asia. — Sea-level rise and an increase in the intensity of tropical cyclones would displace tens of millions of people in low-lying coastal areas of temperate and tropical Asia; increased intensity of rainfall would increase flood risks in temperate and tropical Asia.
Latin America	— Adaptive capacity of human systems is low, particularly with respect to climate events, and vulnerability high.

Region	*Adaptive capacity, vulnerability and key concerns*
	— Loss and retreat of glaciers would adversely impact runoff and water supply in areas where glacier melt is an important water source. — Floods and droughts would become more frequent with floods increasing sediment loads and degrade water quality in some areas. — Increases in the intensity of tropical cyclones would alter the risks to life, property, and ecosystems from heavy rain, flooding, storm surges, and wind damages. — Yields of important crops are projected to decrease in many locations, even when the effects of CO_2 are taken into account; subsistence farming in some regions of could be threatened. — The geographical distribution of vector-borne diseases would expand towards the poles and to high elevations, and exposures to diseases such as malaria, dengue fever and cholera will increase. — Coastal human settlements, productive activities, infrastructure, and mangrove ecosystems would be negatively affected by sea-level rise. — The rate of biodiversity loss would increase.
Small island states	— Adaptive capacity of human systems is generally low and vulnerability high; small island states will be among the most seriously impacted by climate change. — The projected annual sea-level rise of 5 millimetres for the next 100 years would cause enhanced coastal erosion, loss of land and property, dislocation of people, increased risk from storm surges, reduced resilience of coastal ecosystems, saltwater intrusion into freshwater resources, and high resource costs to respond and adapt to these changes. — Islands with limited water supplies are highly vulnerable to the impacts of climate change on the water balance. — Coral reefs would be negatively affected by bleaching and by reduced calcification rates due to higher CO_2 level; mangrove, sea grass bed, and other coastal ecosystems and the associated biodiversity would be adversely affected by rising temperatures and accelerated sea-level rise. — Declines in coastal ecosystems would negatively impact reef fish and threaten reef fisheries, those who earn their livelihoods from reef fisheries, and those who rely on the fisheries as a significant food source. — Limited arable land and soil salinisation makes agriculture, both for domestic food production and cash crop exports, highly vulnerable to climate change. — Tourism would face severe disruption from climate change and sea-level rise.
Europe	— Adaptive capacity is generally high for human systems; southern Europe and the European Arctic are more vulnerable than other parts of Europe. — Summer runoff, water availability, and soil moisture are likely to decrease in southern Europe, and would widen the difference between the north and drought-prone south; increases are likely in winter in the south and north. — Half of alpine glaciers and large permafrost areas could disappear by end of 21st century. — River flood hazard will increase across much of Europe; in coastal areas the risk of flooding, erosion, and wetland loss will increase substantially with implications for human settlement, industry, tourism, agriculture, and coastal natural habitats. — There will be some broadly positive effects on agriculture in northern Europe; productivity will decrease in southern and eastern Europe.

Annex 2: List of Publications (in chronological order)

Are developing countries already doing as much as industrialised countries to slow climate change?, Walter Reid and Jose Goldemberg, World Resources Institute, July 1997.

Environmental evaluation synthesis study, Environment: mainstreamed or sidelined, Michael Flint et al, DFID, January 2000.

Achieving sustainability: poverty elimination and the environment, DFID, October 2000.

Calculating the level of DFID resources which contribute to dealing with the effects of climate change, Environmental Change Institute, Oxford University, November 2000.

Eliminating world poverty: making globalisation work for the poor, DFID, December 2000.

Summary for policy makers, Climate change 2001: impacts, adaptation and vulnerability, Intergovernmental Panel on climate change, February 2001.

Poverty reduction strategies and environment, Jan Bojo and Rama Chandra Reddy, IBRD, August 2001.

Poverty and the environment: what the poor say, Mary Ann Brocklesby and Emily Hinshelwood, EPD, DFID, October 2001.

Entering the 21st Century, World Development Report, 1999–2000, IBRD, September 2000.

Department for International Development

December 2001

Memorandum submitted by the Department for Environment, Food and Rural Affairs

EXECUTIVE SUMMARY

Climate change is the result of unsustainable development and substantial cuts in greenhouse gas emissions will be needed to stabilise concentrations of greenhouse gases in the atmosphere. The Kyoto Protocol provides a framework for international action to tackle a global problem but it is only a first step. Developing countries, particularly the poorest and the most vulnerable people within those countries, will be the most severely affected by the adverse impacts of climate change. These impacts will exacerbate global problems such as drought, famine, disease, vulnerability, insecurity, and population displacements, and seriously impede poor countries' efforts to develop sustainably and tackle poverty. Without serious action to mitigate climate change and to integrate its consideration into all areas of policy, action to achieve the Millennium Development Goals will be in jeopardy. Whilst developing countries must have the right and opportunity to develop and developed countries must work in partnership with them to eliminate poverty, effective mitigation will—in due course—require action and participation by all countries, if the worst impacts of climate change are to be avoided

1. INTRODUCTION

Climate Change and Sustainable Development

1.1 The concept of sustainable development was first introduced in the IUCN/WWF/UNEP World Conservation Strategy of 1980. It proposed the preservation of nature from human exploitation by physical segregation of the seemingly conflicting goals of environmental sensitivity and economic growth. The World Commission on Environment and Development's 1987 Report, Our Common Future, sought to end this dichotomy through the marriage of environmental and developmental goals under a single definition. Sustainable development was formally defined as meeting "...the needs of the present without compromising the ability of future generations to meet their own needs".

1.2 The 1999 UK Government Sustainable Development Strategy interprets the 1987 Brundtland definition as "...ensuring a better quality of life for everyone, now and for generations to come" —which requires meeting four objectives at the same time, both in the UK and the world as a whole:

- social progress which recognises the needs of everybody;
- effective protection of the environment;
- prudent use of natural resources; and
- maintenance of high and stable levels of economic growth and employment.

1.3 Although meeting economic, social and environmental objectives together should be the aim, conflicting impact—particularly in the short term—will arise. Where potential conflicts are identified, efforts should first be made to find creative solutions—including reviewing goals and re-evaluating options. Mitigation measures should be considered, eg compensation, substitution. Trade-offs should be a last resort but should always be made transparent and accessible. To ensure opportunities are grasped wherever possible, action to promote and integrate sustainable development in policy development and implementation is needed at all levels—global, national and local.

1.4 At global level, problems such as climate change, poverty, migration and disease have become new challenges for the international community as they are too big for nationals to tackle alone. There is broad consensus that global solutions are needed to global problems—although this does not of course absolve individual countries and actors from taking appropriate action. The problem of climate change—which is the result of unsustainable development—requires co-ordinated action because of the nature and the scale of the problem and the difficult issues and judgements required to tackle it. For example, assessing the relative economic, social and environmental costs and benefits of the options for action, and the relative weight attached to the wellbeing of current generations compared to those of the future. Action to tackle climate change is intimately linked to achievement of the Millennium Development Goals, as without effective action on the former progress to reduce poverty and vulnerability will be jeopardised. The rate of climate change will bring more intense and unpredictable impacts that will be felt across the world. For example, sea-level rise threatens the existence of some small island states and puts millions of people at risk from flooding. Temperature increases, drought and flooding will affect people's health and way of life, and cause the irreversible loss of many species of plants and animals. The economic, human and environmental costs are likely to be large and could create political tension within and between countries, exacerbating regional instability.

DEFRA's Role and Responsibilities

1.5 The Secretary of State for Environment, Food and Rural Affairs has lead policy responsibility within Whitehall for both climate change and sustainable development—but DFID clearly has a key role, interest and expertise in issues pertaining to sustainable development in developing countries. The Deputy Prime Minister also continues to play a role in international climate change discussions and negotiations on behalf of the Prime Minister. More recently, the Prime Minister has asked the Deputy Prime Minister to take on a similar role in preparation for the World Summit on Sustainable Development (WSSD) to be held in Johannesburg in 2002.

1.6 In developing policy and implementing initiatives, DEFRA works closely with a wide range of government departments and the devolved administrations. The UK Delegations that the Secretary of State for Environment, Food and Rural Affairs led during the international climate change negotiations in 2001 included officials from DEFRA, the Foreign and Commonwealth Office (FCO), the Department of Trade and Industry (DTI), Cabinet Office (CO), the Department for International Development (DFID), and the Scottish Executive. British High Commissions and Embassies also make an important contribution to the pursuit and attainment of the UK's goals through regularly communicating the views of local interlocutors on key issues to London-based officials and vice versa.

Structure of Memorandum

1.7 The remainder of this memorandum is structured in six parts. The first section summarises the key scientific findings on climate change, describing the latest IPCC projections and their implications and the possible impacts of climate change on developing countries. The second section describes the policy response to this problem at three levels—international, European Union (EU) and the UK. Section four examines some of the main aspects of the Kyoto Protocol and associated decisions that are of relevance and interest to developing countries. The fifth section looks ahead to describe the next steps and future challenges, and the final section draws the preceding strands together.

2. Climate Change Science

The Third Assessment Report (TAR)[6]

2.1 The Inter-governmental Panel on Climate Change (IPCC) TAR projected temperature rises, using a full range of socio-economic scenarios (1999), of 1.4–5.8°C by 2100. Such rises in temperature and climate change will have widespread impacts that will be more severe the greater the temperature rise. Developing countries are especially vulnerable to climate change that will hinder their efforts to develop. A sustainable approach requires that greenhouse gas concentrations are stabilised in the atmosphere at a level which avoids dangerous climate change. For stabilisation to occur emissions will eventually have to drop well below current levels. However, it will be impossible to stabilise concentrations unless all countries including developing countries, eventually take on emission reduction or limitation targets.

2.2 The TAR notes that, with regard to the climate system, "the basis for determining what constitutes 'dangerous anthropogenic interference' will vary among regions—depending both on the local nature and consequences of climate change impacts, and also on the adaptive capacity available to cope with climate change—and depends upon mitigation capacity, since the magnitude and the rate of change are both important". Whilst there is as yet no internationally agreed limit on atmospheric carbon dioxide concentrations, the EU has indicated that a level lower than 550 ppm of CO_2, which is about twice the pre-industrial concentration, should guide global limitation and reduction efforts. The Royal Commission on Environmental Pollution (RCEP) has also recommended that concentrations of 550 ppm should not be exceeded. This may be a useful interim guideline but it is not necessarily the final answer. The choice of an upper limit for carbon dioxide concentration in the atmosphere is one for which there is no international consensus and indeed no clear scientific guideline.

---

[6] Approved by the IPCC in September 2001.

2.3 The TAR notes the range of temperatures that could result for different stabilisation levels. At 550 ppm the range is approximately 2.0–5.2°C above 1990 levels depending on the sensitivity of the climate system to the additional radiative forcing due to CO_2. This range poses difficulties in assessing the impacts of a particular stabilisation level. The scientific uncertainties are such that for low sensitivity relatively modest globally aggregated impacts may be found at 550 ppm, although there is still potential for significant local/sub-regional impacts. However, at high sensitivity there are considerable risks that significant damage could be experienced. The global aggregation of impacts is controversial as they treat gains for some as cancelling out losses for others and because the process requires considerable subjectivity.

2.4 Assuming middle range climate sensitivity, mitigation costs show a fairly gradual increase down to stabilisation at 550 ppm but a significantly faster increase for lower stabilisation levels. Additionally the TAR makes a tentative assessment of the impacts of climate change that may be associated with different temperature levels.

Impacts on developing countries

2.5 The IPCC's TAR confirms that:

- regional changes in climate, particularly increases in temperature, have already affected a diverse set of biological and physical systems in many parts of the world;
- projected impacts, including the impacts of future changes due to extreme climate events, tend to fall disproportionately on the poor;
- adverse changes in seasonal river flows, floods and droughts, food security, fisheries, health effects and loss of biodiversity are among the major regional vulnerabilities and concerns of Africa, Latin America and Asia where adaptation opportunities are generally low;
- those with the least resources have the least capacity to adapt and are the most vulnerable; and
- the majority of people will be adversely affected by climate change even for small increases in temperature. For example:
    - increased risks to life, health and property from extreme events and potentially large-scale population displacements;
    - increases in vector diseases such as malaria;
    - widespread increases in flooding due to more extreme precipitation and sea level rise;
    - more landslides and avalanches;
    - reduced crop yields in the tropics;
    - increase in crop yields in mid latitudes up to a few degrees of warming (about 2–3°C) than reductions;
    - increases and decreases in water availability in water scarce regions;
    - some possible benefits in particular regions or sectors for small increases in temperature, eg reduced winter mortality due to reduced cold periods;
    - climate change is likely to have increasingly negative impacts on GDP for developing countries at all temperature rises, with mixed effects on developed countries up to a few degrees and negative above.

2.6 Advances in understanding of impacts and adaptation made since previous IPCC reports indicate a need for initiatives to begin designing adaptation strategies and building adaptive capacities. Further research is required, however, to strengthen future assessments and to reduce uncertainties in order to ensure that sufficient information is available for policymaking about responses to possible consequences of climate change, including research in and by developing countries.

3. Policy Response

The International Framework

3.1 The United Nations Framework Convention on Climate Change entered into force in 1994. It represented the international community's initial response to the problem of climate change. The ultimate objective of the Convention is the "...stabilisation of greenhouse gases at a level that would prevent dangerous anthropogenic interference with the climate system" (although this level has yet to be agreed). Underlying this is the principle that countries should take action in accordance with their common but differentiated responsibilities and respective capabilities. Developed countries (known as Annex 1 countries) agreed to take the lead under the Convention, given their responsibility for the largest share of historic and current emissions. In line with this, they committed themselves to the aim of returning their emissions to 1990 levels by the year 2000 and the UK was one of small number of countries that achieved this.

3.2 The Convention established a framework for future co-operation and, in recognition that more demanding commitments were needed from developed countries than those under the Convention, Parties to agree a more ambitious Treaty in 1997, the Kyoto Protocol. Under the Kyoto Protocol, Annex 1 countries agreed to reduce their combined emissions of a basket of six greenhouse gases by a least 5 per cent compared to 1990 levels by 2008-12. The Protocol provides for three market mechanisms (described in paragraph 4.6) which allow developed countries to meet their commitments more cost-effectively by "buying" or generating emission reduction credits in other countries. Developed countries are also permitted to reduce credit towards their emissions targets through certain land use, land use change and forestry activities (also known as "sinks").

3.3 The Protocol provided the framework for further international action but did not address the many detailed questions that needed to be worked out to facilitate the Protocol's implementation. In view of this, the international negotiations since 1997 have focussed on developing the necessary rules. They culminated with the adoption of a political agreement at the Sixth Conference of the Parties (COP6bis) in July 2001 ("the Bonn Agreement") on the framework giving effect to Kyoto, which was translated into legal decision texts ("the Marrakech Accords") at COP7 in November 2001. This deal was a tremendous political achievement. For the first time, there are clear and agreed rules governing how developed countries could take action to fulfil their emission reduction and limitation targets. The US's withdrawal from Kyoto (see paragraph 5.6) has reduced the reductions achievable under Kyoto. However, even without US participation, the effect of climate change policies of countries with such binding targets should be equivalent to a reduction of about 9 per cent in total developed country emissions below business as usual in 2010 (or almost 2 per cent if excess assigned amount units and sinks credits are stripped out of the calculation). More significantly, Kyoto's entry into force will put in place a global framework for future action to reduce greenhouse gas emissions.

The European Union

3.4 Under the Kyoto Protocol, the EU collectively agreed to cut the level of its greenhouse gas emissions by 8 per cent compared to 1990 levels by the end of the first commitment period (2008–12). This collective target was distributed between Member States under a burden-sharing agreement (under which Member States targets ranged from -21 per cent for Germany and Denmark to a limitation target of +27 per cent for Portugal).

3.5 Negotiations within the EU on a number of issues crucial for taking forward the Community's work on climate change are currently ongoing. Specifically, discussions involve:

- *A proposed EU Emissions Trading Directive*—This would establish a Europe-wide emission trading scheme, which would be regulated through a permitting procedure setting limits on carbon dioxide emissions between 2005-07 initially.
- *The European Climate Change Programme*—This package of common and co-ordinated policies and measures will help reduce greenhouse gas emissions across the EU, and has been prepared in discussion with Member States and other stakeholders from business and NGOs.
- *Council Decision on ratification of the Kyoto Protocol*—This sets out the emission commitments agreed by Member States, and places an obligation on each to take the measures necessary to comply with their respective commitments.

3.6 Through its development programmes, the EU is also seeking to assist developing countries tackle and adapt to climate change. Close co-operation will be required with other donors and multilateral institutions in taking forward this work and climate change considerations will need to be fully integrated in the EU's policy, and programme and project design cycles.

The UK

3.7 Under the EU burden sharing agreement, the UK is committed to reducing its emissions of greenhouse gases by 12.5 per cent by 2008-12. However, the Government estimates that it could deliver a 23 per cent reduction in greenhouse gas emissions below 1990 levels by 2010, which is well beyond our Kyoto target. The UK's strategic approach to tackling climate change is set out in the UK's Climate Change Programme (CCP), published in November 2000. The programme focuses on practical action to reduce emissions over the next decade and contains a package of policies and measures covering all sectors of the economy. There is also a range of measures that cannot currently be quantified, for example, action by local authorities and public awareness programmes. The UK was one of the first countries to publish its Third National Communication to the United Nations Framework Convention on Climate Change on 30 October 2001. The Communication provides an update on the substantial progress that has been by the Government with implementing the policies in the programme. Copies of both the CCP and Third National Communication can be found in the library of the House.

3.8 In addition to the provision of assistance through the UK's bilateral development programme, the UK also supports research into climate change and its impacts on developing countries (see Annex A) and a range of projects through the joint DEFRA-FCO Climate Change Challenge Fund (see Annex B).

3.9 Other relevant work that the Government is engaged in includes its Sustainable Energy Initiative to promote low carbon energy in developing countries following up the work done by the G8 on renewable energy and the establishment a Climate Change Projects Office (CCPO) in May 2001. The CCPO's aim is to facilitate and promote the participation of UK businesses in Clean Development Mechanism (CDM) and Joint Implementation (JI) projects, and to enhance UK industry's ability to capitalise on the significant anticipated commercial climate change opportunities.

4. KYOTO AND DEVELOPING COUNTRIES

Developing country commitments

4.1 Although developing countries have not taken on legally binding emission targets, they have to have other obligations under the Framework Convention and the Kyoto Protocol. For example, under the deal that was reached in Marrakech, developing countries are required to publish national greenhouse gas emissions inventories, and to put in place national programmes containing measures to mitigate climate change. The Clean Development Mechanism (see paragraphs 4.6—4.11 below) provides an opportunity for developing countries to participate directly in projects to reduce emissions.

4.2 In addition to reducing or limiting their greenhouse gas emissions, developed countries are also required to provide assistance to developing countries under the Convention and Protocol. For example, the UNFCCC requires developed countries to help particularly vulnerable developing countries meet the costs of adaptation to the adverse effects of climate change, to assist the transfer of environmentally sound technologies to developing countries and economies in transition, and to support capacity building. This approach recognises that it is essential that economies are allowed to grow and develop whilst providing assistance to developing countries which should ensure that their economies develop in a more sustainable way.

Funding

4.3 In order to meet their commitments, developed countries agreed to provide new and additional financial resources to help developing countries meet their Convention obligations. The Bonn Agreement invited the Global Environment Facility (GEF) to establish three new funds to provide assistance to developing countries:

- *Special Climate Change Fund*—to finance activities to assist developing countries, including in the fields of adaptation and technology transfer.
- *Least Developed Countries Fund*—to support a work programme for least developed countries (LDCs), including the preparation and implementation of national adaptation programmes of action (NAPAs).
- *Kyoto Protocol Adaptation Fund*—to finance adaptation projects in developing countries that have become parties to the Kyoto Protocol. The fund will be financed in part by a share of the proceeds from the Clean Development Mechanism.

4.4 In addition, the EU, Canada, New Zealand, Norway, Iceland and Switzerland made a joint political declaration at Bonn committing themselves to increase their climate change funding for developing countries to $410 million a year by 2005. Funding that will be counted towards this target includes: contributions to the Global Environment Facility (GEF) climate change-related activities; funding for the three new funds detailed above; and bilateral and multi-lateral funding that is additional to current levels.

Least Developed Countries

4.5 In Marrakech, a number of decisions were agreed on issues of special significance to Least Developed Countries (LDC). The adoption of guidance on the operation of the LDC Fund should make it the first of the new funds agreed in Bonn to begin funding projects. The Seventh Conference of the Parties also agreed to the establishment of a special body to assist LDCs in adapting to the problem of climate change—the LDC Expert Group. This has particular significance, as no other groups were established representing any of the other special interests recognised under the Convention.

The Clean Development Mechanism

4.6 To assist countries in meeting their Kyoto targets as cost effectively as possible, the Kyoto Protocol provides for three market mechanisms. The basic idea behind them is that the effect on the global environment of reducing or limiting emissions is the same wherever the emissions come from, so it is better to take action where the cost is lowest. The three mechanisms are:

- *International Emissions Trading (IET)*—Parties with targets under Kyoto can participate in international emissions trading or can authorise their legal entities to take part in international emissions trading. In order to meet their target, Parties (or their legal entities) can either make "in house" emission reductions (and can sell any reductions surplus to their requirements on the market) or they can buy tradable emission allowances as a way of meeting their targets.
- *Joint Implementation (JI)*—JI involves two Annex 1 countries with targets under Kyoto. Country A could invest in a project in country B that reduced the emissions of Country by x tonnes. Country B would then transfer x tonnes of its assigned amount units (ie units that correspond to its permitted level of emissions under Kyoto) to Country A. Transition countries are most likely to want to host JI projects.
- *The Clean Development Mechanism (CDM)*—Like JI, the CDM is a project based mechanism. Parties can undertake emission reduction or avoidance projects in developing countries. These projects can generate Certified Emissions Reductions (CERs) that can be used by developed countries to meet their Kyoto targets.

4.7 Of the three mechanisms, the CDM is the one of most interest to developing countries. The modalities and procedures for the CDM were adopted at COP7. Unlike IET and JI, the CDM has a dual purpose—to assist Annex 1 Parties meet their Kyoto targets and to assist developing countries in achieving sustainable development. Consistent with the latter objective, CDM project proposals may only be registered if the host country has confirmed that the project activity assists it in achieving sustainable development. The rules governing the CDM project cycle also require project developers to consult local stakeholders and to analyse the environmental impacts of their proposal and, if they are significant, undertake an Environmental Impact Assessment.

4.8 The CDM is the only Kyoto mechanism to enjoy a "prompt start" which means that it is possible for projects starting from the year 2000 to generate Certified Emission Reductions. However, to be eligible, projects must be additional—ie result in a greater reduction (or avoidance) of GHG emission reductions than would have resulted from under the "business as usual"/without project scenario. Many developing countries hope that the CDM will help them to attract greater foreign direct investment. However, the amount of investment expected through the CDM has been adversely affected by the US's withdrawal from Kyoto in March 2001.

Equitable Distribution of CDM Projects

4.9 Developing countries (particularly in Africa) have also been concerned about the equitable distribution of Clean Development Mechanism (CDM) projects. Evidence suggests that 80 per cent of CDM investment will go to a very few countries (eg India, China, Brazil). Some Parties (especially in sub-Saharan Africa) will have problems attracting any CDM projects as their very low (ie non-fossil fuel) emissions baseline gives fewer opportunities for projects and the same barriers to foreign direct investment (FDI) in LDCs are likely to apply to the CDM as well.

4.10 Analysis suggests that poorer developing countries would be more likely to attract small, as opposed to large, scale investment, and that smaller scale projects have the potential to achieve higher development benefits, in particular higher poverty reduction impact within developing countries. However, the transaction costs associated with complying with the modalities and procedures of the CDM have been estimated to be as much as tens of thousands of pounds. As these costs are unlikely to vary significantly with the size of the project, they will comprise a larger percentage of the total costs of a small-scale project. This may make small-scale environmentally additional projects economically unviable and have an adverse bearing on the equitable distribution of CDM projects.

4.11 In recognition of this, it was felt that the key to improving the chances of LDCs hosting projects was to make small-scale projects attractive to investors by minimising transaction costs. This could be achieved through the development of simplified procedures for small-scale projects and this was something the EU pressed for with the negotiations. Parties therefore agreed that simplified modalities and procedures should be devised for small-scale project activities and this task has been give to the Executive Board (the body responsible for overseeing the CDM under the supervision of the COP).

Adaptation

4.12 The UK and other donor countries have resisted providing full funding for adaptation projects before the adoption of credible adaptation strategies by developing countries. The first step would be to provide a national communication on Climate Change Convention objectives, or, for LDCs, a national adaptation programme of action. The UK would consider providing adaptation assistance where the work forms a credible part of an overall poverty reduction strategy. As part of the package adopted at Marrakech (described above), some support for adaptation was agreed. The Government has not yet decided which of the new funds would be the best vehicle for delivering effective support on adaptation.

5. Next Steps and Future Challenges

The Kyoto Protocol's Ratification and Entry into Force

5.1 The Marrakech Accords should pave the way for prompt entry into force of the Kyoto Protocol. This is triggered once a minimum of 55 countries have ratified the Protocol, including Annex 1 countries accounting for at least 55 per cent of this industrialised group's emissions in 1990. As of 11 December 2001, 46 countries had ratified Kyoto. The UK, along with the rest of the EU, is committed to ratify the Protocol in time to allow its entry into force by the World Summit on Sustainable Development in Johannesburg in 2002.

5.2 Following the US withdrawal, it is essential that both Russia and Japan ratify the Protocol, in addition to the EU and Central and Eastern European countries (that have signalled their intention to ratify to the same timetable as the EU). Immediately after Marrakech, the Japanese Government announced that it would now press ahead with preparations for ratification in 2002. Russia was also positive about ratification at the final plenary session in Marrakech, but it will be important to secure a clear commitment to ratification. The UK will also strongly encourage other industrialised countries to ratify the Protocol. This is important both from an environmental point of view, and in order to send a clear signal to developing countries that the developed world is serious about tackling this problem.

The World Summit on Sustainable Development and Climate Change

5.3 The World Summit on Sustainable Development will take place in South Africa from 26 August to 4 September 2002. It will mark the tenth anniversary of the Rio "Earth Summit" which, amongst other things, set in process the UN Framework Convention on Climate Change. As one of the most important outcomes from the Rio process the issue of climate change will inevitably feature. However, the ongoing UNFCCC process is the most productive format for taking forward the issue of climate change, particularly given the successful outcomes of Bonn and Marrakech, and therefore we do not expect climate change to be one of the major agenda items of the Summit.

5.4 The Summit will focus instead on where there have been "gaps" in implementing Agenda 21. The Summit is expected to look at implementation mechanisms for sustainable development, in particular the involvement of the private sector and NGOs, and sectoral issues including energy, transfer of technology, and resource efficiency, all of which will have linkages to climate change.

The Eighth Conference of Parties (COP8)

5.5 The eighth Conference of Parties to the UNFCCC—or if, as hoped, the Kyoto Protocol has already entered into force by WSSD, the first session of the Conference of the Parties serving as the meeting of the Parties of the Kyoto Protocol—is scheduled for 23 October to 1 November 2002. At the Conference, work will continue on developing further rules and guidance on which Kyoto will operate and other issues concerning the implementation of the Marrakech Accords. The UK Government also wants to take forward the debate on the future of the Convention and associated key issues such as the level at which greenhouse gas should be stabilised globally, the depth of emissions cuts needed in future commitment periods, and both developed and developing countries' participation in this process.

The US

5.6 In March 2001, President Bush announced that the US was withdrawing from the Kyoto because of its impact on the US economy and limited extent of developing country participation. President Bush has recognised that climate change is a serious challenge and the Administration is currently undertaking a climate change policy review to consider what action the US should take. The UK Government is encouraging the US to develop proposals for domestic action that demonstrate the US is serious about tackling climate change and that are compatible with the Kyoto process. Key to this is the need for binding targets and the compatibility of technical details—in particular, greenhouse gas coverage, Global Warming Potentials (GWP) and the technical standards for registries. Serious US action is necessary both to the achievement of the overall objective of the Convention and to the negotiations on future targets. The UK Government would of course like to see the US fully re-engage with the international process to tackle climate change in due course and the door remains open for them to do so at any time.

Negotiations on future targets

5.7 To achieve the overall objective of the UNFCCC and stabilise concentrations of the greenhouse gases (GHG) in the atmosphere, deeper cuts in GHG will be required in the second and subsequent Kyoto commitment periods. The negotiations on the rules and targets for the second commitment period must begin by 2005 and, in this context, it will be important to enter into a dialogue with developing countries about their future rights and responsibilities. As developing countries aspire—and are encouraged—to develop, their emissions are set to rise substantially. Nobody contests the right of, and need for, poor countries to develop to reduce poverty and make progress towards the attainment of the Millennium Development Goals—the key issue is the manner in which they (and developed countries) do this. To ensure a prosperous future for poor and rich countries alike that respects the quality of life and the environment, development must be sustainable and this requires action to be taken which respects the environmental limits of the planet.

5.8 There is a need to instigate a debate, and agree on a process, for deciding how responsibility for tackling climate change is going to be shared in future and the form it will take. Future commitments will need to take account of countries' different levels of development and be appropriate to their circumstances. For example, developing countries will need commitments that do not impede growth but ensure it is clean and sustainable and emissions are avoided as well as reduced. And developed countries will need to make deeper absolute cuts in their emissions levels and support developing countries through capacity building, technology transfer and targeted resource transfers for activities such as adaptation. Clearly any serious domestic action by the US (alongside the measures other developed countries will take under the Kyoto Protocol) will be critical if developing countries are to be willing to take on further commitments of their own in the future.

6. CONCLUSION

6.1 Climate change is a threat to sustainable development in all countries but, due to the uneven geographical impacts of climate change, resource shortages and capacity problems, developing countries are likely to be the most vulnerable, particularly the poorest. Action is being taken to tackle climate change and the achievements to date should not be underestimated. However, they represent only a first step and much deeper cuts in greenhouse gases will be needed if the most severe adverse impacts of climate change are to be avoided. That said, even with immediate action, some impacts of climate change are unavoidable due to the current concentration of GHGs in the atmosphere—it is therefore critical that consideratoin climate change is integrated into development policies at all levels to ensure poor countries can adapt as effectively as possible.

6.2 As well as being affected by climate change, developing countries are also increasingly contributing to increases in anthropogenic GHG emission levels. Under the principle of "common but differentiated responsibility" developing countries are not subject to targets for the first Kyoto commitment period (2008–2012). This reflects the fact that, given their historical level of emissions, developed countries undertook to act first and cut back their emissions to create space for poorer countries to develop. However, the emissions of developing countries are expected to increase rapidly and countries such as China and India are already significant emitters. To stabilise level of greenhouse gases, developing countries have to join developed countries in taking action to reduce or avoid GHG emissions. Key to this is the need to develop a dialogue and a process through which all countries can constructively engage to this end, including the United States.

Department for Environment, Food and Rural Affairs

January 2002

Annex A

UK-FUNDED RESEARCH

DEFRA instigated a programme of research (known as Fastrack) to provide globally quantitative estimates of the impacts of climate change in five key sectors—ecosystems, water resources, agriculture, health and sea level rise—by bringing together experts from these areas and the Meteorological Centre's Hadley Centre. Work has been published and presented at several Conferences of the Parties to the UNFCCC.

The UK is also funding development of a portable Regional Climate Change Model through the Hadley Centre for Climate Prediction and Research that will enable developing countries to generate their own national climate change scenarios for use in impact and adaptation studies. In addition, the Government supports a number of projects through the UK's bilateral development programme to help developing countries adapt to the impacts of climate change. These projects include assessments of vulnerability to climate change, the evaluation of policy options for monitoring systems and response strategies, the assessment of policy frameworks for implementing adaptation measures and response strategies in the context of coastal zone management, disaster preparedness, agriculture, fisheries and forests, and the building of national regional and/or sub regional institutional capacity.

The UK is undertaking collaborative research projects with India and China on impacts and adaptation to climate change. This work will involve the development of new approaches to assessment of vulnerability and adaptation, and build capacity through promotion of the transfer of methodologies and approaches from the UK. The research will be undertaken by scientists based at local research institutes:

- For India the project will develop national climate change and socio-economic scenarios and will assess the sectoral impacts of climate change on sea level variability, water resources, forests, agriculture, health, and energy industry and transport infrastructure.
- The project with China will focus on the impacts of climate change for agriculture. National climate change scenarios and socio-economic scenarios relevant for agriculture will be developed. The project also aims to build capacity through collaboration with UK experts and training of Chinese scientists at UK institutions during study visits.

Annex B

CLIMATE CHANGE CHALLENGE FUND—PROJECTS FROM 1999–2001

Country	*Project Title*	*Purpose*	*Total budget incl VAT*	*Status*
1. Botswana	Wind energy resource mapping in Botswana	Working with local partners in Botswana to assess potential for wind power for benefit of rural communities	£113,572	On-going
2. Brazil	Demonstration of the Clean Development Mechanism between UK and Brazil	Aimed to demonstrate how the CDM* can work in practice	£127,699	Completed
3. Brazil	Promotion of public/private partnerships to deliver sustainable energy services in North Brazil		£40,000	Completed
4. China	UK-China seminar on climate change, sustainable development and energy efficiency		£15,000	Completed
5. China	Facilitation of landfill gas generation in China	Capacity building for waste management professionals in design, construction and operation of landfill gas schemes	£106,126	On-going
6. China	Improving energy efficiency in buildings in Shanghai	Study on needs and opportunities for improving energy efficiency in Shanghai buildings	£30,785	On-going
7. Ghana	Climate Change Scholarship	Ghanaian official to study for MSc in Climate Change, University of East Anglia	£14,613	Completed
8. India	Two wheeled vehicles emissions testing	A programme of vehicle inspections and maintenance to reduce emissions of carbon dioxide and local air pollutants	£50,000	Completed
9. India, South Africa	Process Integration Technologies	Seminars and demonstration projects on process integration technologies to provide environmental benefits in India and South Africa	£117,970	Completed
10. Indonesia	The Eco-Indorganics Project	Project using the "EcoSol" Process which captures carbon and nitrogen from agricultural and plantation waste streams and bioconverts them for reuse, preventing their conversion into greenhouse gases	£50,000	On-going

Country	*Project Title*	*Purpose*	*Total budget incl VAT*	*Status*
11. Indonesia, China, Costa Rica, Nicaragua	Feasibility studies for biomass energy projects	Series of studies on potential for rice husk, pig slurry and palm oil mill effluence for biomass energy applications	£140,000	Completed
12. Kazakhstan	Support for Strengthening of National System for Implementation of UNFCCC, Kyoto Protocol and GHG Emissions Reductions Projects in Kazakhstan		£45,500	On-going
13. Kenya	Study of Sustainable Energy Sector in Kenya	Study of sustainable energy projects to produce guidelines for companies wishing to operate in the sector and to examine the opportunities for CDM	£47,480	Completed
14. Malaysia	Feasibility for landfill gas utilisation in Malaysia		£23,850	Completed
15. Morocco	COP7 Marrakech—Contribution to the UNDP trust fund		£50,000	Completed
16. Nepal	Micro-minibus introduction into Nepal	Electric mirco-buses into Kathmandu, improving local air quality and lowering greenhouse gas emissions	£111,911	On-going
17. Philippines	Exploitation of marine currents in the Philippines	To assess the most promising locations for harnessing marine currents for power generation	£48,763	Completed
18. Philippines	Biological treatment of municipal waste streams	Feasibility study for methane gas recovery and use from municipal waste streams in Manila	£50,000	Completed
19. Russia	Financing Cleaner Energy in Russia	A study of green investment strategies for trilateral (Russia, EU and Japan) co-operation on climate and energy	£25,000	On-going
20. Russia/EU	"Energy and Climate: Russian-European Partnership" Workshop		£35,000	Completed
21. South Africa	Rural Energy in South Africa	Workshops to help develop practical methods of financing and delivering renewable energy systems in rural South Africa	£5,875	Completed
22. South Africa	Capacity Building for clean development mechanism in South Africa	Identify and prioritise capacity building requirements at national and industry sector levels for implementation of CDM	£50,500	On-going

Country	Project Title	Purpose	Total budget incl VAT	Status
23. Uganda, Zambia, Senegal	CDM Project in Uganda, Zambia and Senegal	Capacity building, training and information dissemination to help Uganda, Zambia and Senegal participate in CDM	£37,660	Completed
24. Various	Dialogue on the Clean Development Mechanism	CDM Dialogue bringing together high-level negotiators from EU, umbrella group and developing countries	£40,000	Completed
25. Various	World Renewable Energy Network Seminar	Funding to enable 30 participants from Brazil, China, India, Indonesia, South Africa and Russia to attend World Renewable Energy Congress in Brighton, July 2000	£30,000	Completed
26. Various	Research into State of the Art Financing and Financing Mechanisms for Joint Implementation Projects		£15,569	Completed
27. Various	Enabling small-scale CDM projects in least developed countries	The project will determine how small-scale projects can be cost effectively supported under CDM and development risks reduced	£55,843	On-going
28 Various	Solving the CDM maze for renewable energy technologies	Use of four renewable energy technology case studies to draw up comprehensive guidelines for assessing additionality and establishing baselines for CDM projects in the renewable energy sector, providing policy-makers and potential investors with a tool for selection of possible CDM projects	£52,000	Completed
29. Various	Part-funding for RIIA/WRI/WBCSD Workshop "Building a Low Carbon Future: The Role of Governments, Business and NGOs" June 2001		£8,000	Completed
30. Various	Delivering Kyoto—Could Europe Do It?	Support for a major two-day international conference organised by The Royal Institute for International Affairs	£8,000	Completed

* Clean Development Mechanism

Total number of projects funded	30
No of projects completed	21
No of projects on-going	6
Total amount of funds	£1,546,716

Examination of Witnesses

MR RICHARD MANNING, Director-General, Resources, MR ANDREW BENNETT, Chief Natural Resources Adviser, and MR ADRIAN DAVIS, Head, Environment Policy Department, Department for International Development, and MR DAVID WARRILOW, Head of Science Policy, Global Atmosphere Division, Department for Environment, Food and Rural Affairs, examined.

Chairman

1. Good morning. Mr Manning, thank you very much for coming this morning with your colleagues. As the record shows, you are the Director-General, Resources at DFID, Andrew Bennett is the Chief Natural Resources Adviser, Adrian Davis is the Head, Environment Policy Department and Mr Warrilow, you are from DEFRA. Would you just like to tell us your role there?

(*Mr Warrilow*) My role is to provide scientific advice on climate change and to ensure that the scientific and technical aspects cover IPCC for example.

Chairman: I should just like to read you a bit of our brief because we have quite a long brief. If I read you what our agenda is, then that might help you in terms of answering the questions. We shall try to keep our questions as short as possible. It would be useful if this evidence session could help: to understand how DFID deals with an issue whose nature and impact is uncertain; to understand how much DFID knows about climate change and the impact of its projects and programmes relating to climate change; to determine whether DFID is able to forecast the level of effort it will have to put into dealing with climate change issues; to understand what role DFID intends to play in mainstreaming climate change considerations; to discover whether enough is known to be able to enact strategies to help mainstreaming now. The DFID memorandum talks in general terms about what DFID is doing but has few real examples of work which is being undertaken. It would be helpful if during the course of the evidence session the witnesses could be encouraged to give actual examples to illustrate what DFID is doing. Wherever possible, if you could give current examples that would be much appreciated. For example, paragraph 3 of DFID's memorandum lists reasons why environmental considerations have failed to be incorporated into sustainable development but gives no examples. At paragraph 13, it gives no examples of how it is helping countries to integrate environmental issues into Poverty Reduction Strategy Programmes (PRSPs). It does not include any examples to illustrate the kind of work the multilateral agencies DFID is partnered with are carrying out as part of the poverty-environment partnership. At paragraph 26 DFID outlines some work it intends to do raising awareness and describes a "portable model" to assist with planning. Examples of how this might work could be useful. Paragraphs 27-29 deal with mitigation but again give no concrete examples of the actions DFID is taking. I hope that gives a flavour. What we are keen to do is try to relate the general principles to the exact policy work which you are doing.

Mr Khabra

2. This session is on the Committee's inquiry into global climate change and sustainable development and trying to find out what DFID is doing. Some of the questions will be to identify who is vulnerable. Where are the vulnerable livelihoods and which countries has DFID prioritised for action? How does DFID identify vulnerable communities and vulnerable countries? Is DFID's assessment of vulnerability based only on current environmental risks such as: threats to livelihoods, environmental degradation or natural resource depletion; or is account taken of future risks arising from climate change?

(*Mr Manning*) We take as our basis the work which is being done internationally by the IPCC and you have attached to our memorandum the summary of how the IPCC feel that the regional impact will be felt. We take that as the basis for looking at this. Our mandate in DFID is to try to act on world poverty. What we see is that on the whole the most vulnerable people are likely to be the poor people. We see that partly because the regional spread of effects given by the IPCC shows more negative effects in areas of the world where a lot of poor people are living, for example the way in which climate is already changing in the Sahel region of Africa—and I think you will be visiting some of the Sahelian fringe countries in March—similar effects in southern Africa, the possibility of more variability in the monsoon in India and the effect of potentially rising sea levels on areas particularly vulnerable to that, of which Bangladesh would be a particularly good example. We can see a number of countries and regions which look vulnerable; within those we certainly expect that poor people will be particularly vulnerable because of the circumstances where many of the poor people live. How do we prioritise? In general the aim of our programme is to put as much of our effort as possible into those countries where there is a significant number of poor people—that is how we look at the world—and particularly those countries where we see the opportunity of sustainable development and those countries where Britain perhaps has something particular to offer. If you look at the shape of the British aid programme, you will see heavy concentration on parts of sub-Saharan Africa, on South Asia and in a more selective way in other countries, including countries which have traditional links with the UK. We will look at vulnerabilities to climate change, particularly with reference to those countries where there are significant numbers of poor people, because that is our mission. You asked whether we look at it on the basis of present risks or future risks. A crucial factor in the way we look at this is that the direction of climate change is now fairly clear, but the pace of climate change is highly uncertain. What we do expect to see is an intensification of what we already see. For example, everybody expects that hurricanes and cyclones will

[**Mr Khabra** *Cont*]

over time be on average of a higher intensity and that has clear implications for areas like the Caribbean, areas like the Bay of Bengal, where such events already take place and one may expect them to be more significant. In terms of rising sea levels there are obvious parts of the world which are particularly at risk. We should and do take account of the fact that things we already see manifestations of will become more serious over a longer term and hence we try to plan interventions with that in our minds.

Mr Robathan

3. Do your policies concentrate more on the long-term impacts or on the immediate climatic disasters of which you have spoken or both? How is it reflected and do you think the policies adequately address what are after all the less well understood effects that long-term climatic change will have? It is easy to deal with a hurricane or a typhoon in the Caribbean, but it is much less easy to concentrate on the longer-term impacts and the connection between the increased instance of climatic disasters and long-term impact.

(*Mr Manning*) It is difficult to respond directly to the question of whether we pay more attention to the shorter term or the longer term. We are running a programme which is gradually rising. We obviously have a long tradition of trying to respond to immediate emergencies, for example the major event in Orissa a couple of years ago. At the same time we have for several years been looking at the longer term, particularly in terms of disaster preparedness: there has been a long history of working in the Caribbean; we have done work over the years in the Philippines and elsewhere. We are now starting a five-year programme of work with key partners in Bangladesh, which will involve capacity development for government officials in the legal, diplomatic and technical skills needed to negotiate on climate change. It will include installation in Bangladesh of the regional climate model which has been developed by the UK's Hadley Centre, which will help the Bangladesh Government with prediction of impact, with adaptation and awareness raising. We shall be helping the Bangladesh Government to identify funding opportunities under the clean development mechanism which you will be aware of as part of the Kyoto Protocol and in coordinating the institutional response of government and civil society organisations to help ensure that climatic change is seen as a developmental issue with implications for national planning and policy. I should like to stress the importance we see of integrating a consideration of climate change into other national planning processes. There is always an international tendency to look for a specific set of plans to deal with one particular thing and the world is awash with sectoral plans of one sort and another which have not proved very effective. The direction of our policy is very much to try to integrate these considerations into the overall national strategy process, so we are arguing for example for better understanding of environmental and indeed climate change factors, in the way that reduction strategies and other documents which set the agenda for governments among our partners are developed.

Mr Khabra

4. You mentioned sustainable development. Where sustainability is not possible, what is your attitude to help those countries and conditions such as the ones you mentioned?

(*Mr Manning*) What we see in the real world is a great deal of adaptation by people. People in drought conditions do not on the whole stay put. Although it has not been very much publicised, there has been continued deterioration in the rainfall in the Sahel over the last decade compared with previous decades. One knows that the Sahel has had a long history of drought. People have not stayed put under these conditions, there has been a large amount of migration from the Sahel as people adapt to the year by year changes in the climate. We see a lot of adaptation going on and as we look at ways of helping people with their livelihoods we try to help them cope with that. To give you another example, we are developing a programme for working with very poor people on the char lands of Bangladesh, which, as members of the Committee will know, are these extremely vulnerable and often shifting islands in the delta, where, given population pressures in Bangladesh, a lot of people actually live and try to subsist. We are trying to come up with a medium-term programme to work with some of these communities, to help them make themselves less vulnerable to events of all sorts and help them develop their livelihoods. It is not going to be a case of some blueprint which we are going to drop on them: it is going to be a question of working with communities to see what makes sense in circumstances in which they find themselves, in which a whole series of coping mechanisms are likely to be necessary.

Mr Robathan

5. Climatic change does bring some opportunities for change which can be beneficial to developing countries. Does DFID policy recognise this and assist countries to change crops or whatever it might be? What are you doing to help developing countries ameliorate the negative impacts? You mentioned some things but could you be more specific and in particular could you just for the record clarify one point? You said that you integrate climatic change into the whole of the PRSP. The trouble is that climatic change being a long-term thing people tend to let it drop off the focus. How do you ensure that it is not marginalised by policy makers in developing countries?

(*Mr Manning*) May I first of all invite Andrew Bennett to give some examples of the kind of work we are doing under our research programmes to look at the way in which the natural resources sector, for example, can adapt to increasing stress and then I will come onto your question about integration.

(*Mr Bennett*) Poor people have a range of assets which they can draw on: themselves, communities in which they live, natural assets of land, physical assets of infrastructure and their own financial assets. When one looks at their livelihoods and their vulnerabilities there are things which they are already doing to cope with extreme and unpleasant events: drought, flood, salt and other things which are

[**Mr Robathan** *Cont*]

already there and which they are coping with. The question is whether these traditional systems which have stood them in such good stead will be able to cope with more frequent and more rapid or longer duration extreme events. The things which emerge very quickly in discussions with these societies is that community cohesion, social capital, is extremely important. The way in which communities respond and work together is a very important tool and one needs to build with that grain. The other extreme events they will have to handle are increasing flood, increasing drought, problems of salinity building up, higher temperatures, greater incidence of pests and diseases and a change in the productivity of coastal zones on which they depend. It is possible—and we are already doing it—to help communities adapt their own varieties and farming systems to cope with drought, with flood, with higher temperatures. In many cases, if you look at the Sahelian zone, what in fact has happened is that the Sahel has moved 100 kilometres south. The varieties of crop which were traditionally grown further north are now moving down. It is possible to help communities use their own knowledge and understanding but also to start to augment it through doing research. For example, techniques of zero tillage, which means that you do not plough the land, save not only energy but water and it makes it easier for farmers to do it. This is being done now in vast areas of the Gangetic plain in India and elsewhere in Central and South America. Simple techniques of rainwater harvesting allow communities to trap water. They often need help doing it, not necessarily because they did not know it needed doing, but in the dry season many of them had to migrate. In India large numbers of people migrate to urban areas because it is the only place they can get work to pay for food. If you can provide them with food and support in the country they can build up their own water harvesting techniques, dig their own wells and remain on the land and retain social cohesion at the same time. Very simple techniques like seed priming—soaking the seed before you plant it—improves germination can increase yields at the back end of the year considerably. Salt tolerance—here we are looking primarily at the mechanisms for salt tolerance. How is it that some plants can grow in salty areas and not others? Drought resistance—there is a thing called a grass pea which is often seen as a famine food in many parts of the world but it is actually toxic. It contains an alkaloid which makes you feel very unwell. You can now breed out that toxicity and we have worked with ICARDA (International Centre of Agricultural Research in Dry Areas) to do this; this is one of the international research centres. What I am sketching a picture of is that there are many things which are already happening. You have to start where the communities are, you have to keep that social cohesion, you have to work with the grain, but there are many techniques and technologies which are now coming in which will allow them to do better because we hope that the changes will come gradually. Many of them will choose in the end not to farm; they will seek non-farm and off-farming work but that is looking at other parts of the economy and the work going on under the poverty reduction strategies.

(*Mr Manning*) You asked about how well able we are to help people integrate longer-term considerations into what are often seen as quite short-term decisions such as poverty reduction strategies which are very here and now in the context of debt reduction and the rest of it. The answer is that it is never going to be easy to get fully appropriate balance here, but—and this is a crucial point for the Committee—many of the things which countries should be doing anyway are likely to be positive in a world of climate change. For example, basic things like good governance, free access to the media, better educated population, are all going to be investments which are going to stand countries in good stead in the kind of stresses which climate change will bring on. A lot of the good policies which we would be encouraging any way are policies which will help resilience to climate change. It is fair to say that the origin of the policy reduction strategies, very much in the context of HIPC and the very severe financial short-term difficulties faced by many developing countries, have meant that in many developing countries the activity, at least initially, was seen very much as a kind of Finance Ministry exercise. We have worked quite hard with the international agencies, with other donors, with recipient countries, to try to broaden the dialogue which goes into poverty reduction strategies, particularly as we move from interim poverty reduction strategies to the full PRSP. If the Committee agree, I should like to invite Adrian Davis to say a word or two about the way in which we have worked in Uganda to try to integrate the environmental dimension, not specifically the climate change dimension but the environmental dimension, into the PRSP in that country because it is quite an interesting example that we would like to see used more widely.

(*Mr Davis*) The Uganda example is given in our target strategy paper on page 49, but we were instrumental in ensuring that the poverty eradication action plan involved the national environmental management authority. We got them involved in trying to integrate longer-term environment and sustainability issues. This would encompass climate change but not necessarily focus on it specifically. We have been working more generally on this issue in partnership with others because it does not really make sense to try to do things by ourselves and the two examples are particularly specific co-operation with the World Bank. There is an analysis which shows that environmental sustainability considerations have improved as we move from an interim to a full PRSP and the document you had by the World Bank on poverty reduction strategies and environment illustrate this by means of a numerical scoring system. You could argue with the method but it shows an improvement. We have been co-financing with the World Bank a series of workshops in Africa and Asia and we shall do a series in Latin America too, bringing together Finance Ministry officials and Environment Ministry officials to talk around the general issues along with civil society and the private sector, to talk around the issues of integrating longer-term considerations into the poverty reduction strategy process. The whole sort of ethos of the poverty environment partnership, which is referred to in the memorandum, and on which we have the first draft of the report which will be submitted to the

[**Mr Robathan** *Cont*]

next preparatory committee of WSSD and we shall make available to the Committee, looks at both the micro issues which we have been talking about and the macro issues of integrating environment into PRSPs and it is quite powerful set of organisations which all have the same message. Obviously we are talking from the environmental side, we are therefore people who are committed to trying to get environment into PRSPs. We think it is a sufficiently influential bloc to make sure that the message is understood and received. It is really raising awareness and showing how the environment can be integrated and the relative importance of environmental issues in relation to other actions to reduce poverty. It is clear that you cannot have sustainable poverty reduction without taking account of the environment and natural resources constraints more generally.

Mr Battle

6. May I ask about the internal workings of DFID and how you handle this agenda? Do you have a unit which deals with climate change? Are they research specialists? Do they then feed information across to the programme departments? Do you rely on the IPCC or the Hadley Centre or advice from experts in DEFRA? How do you ensure that the advice you are getting feeds into the programme part of the Department so that it really is mainstreamed?

(*Mr Manning*) That is a very important set of questions and one which we often reflect on internally to try to get it right. I would say this is not an issue specific to environmental climate change. You could take almost any subject which might be of interest to the development and ask yourself how you mainstream it. To give you another obvious example, take disability, clearly a major problem in developing countries, what is the right amount of attention which we should be giving in our programmes to disability? We have to make a series of judgements. The way in which we seek to do this is that we have the side of the office which is managed by our chief advisers—Andrew is here as our Chief Natural Resources Adviser and we have advisers in education, health, economics and so on. Under their control are resources for research and development, some of the research Andrew has talked about, which helps us to understand the science, to understand the social science and try to make sense of whatever the subject happens to be. It is fair to say that DFID is one of the bilateral agencies which has invested significant amounts broadly speaking in the research side of our work over many years. There has been a long tradition going back over decades of paying serious attention to these issues. Secondly, chief advisers play a very important role internationally in trying to work with others in the international community to move opinion forward. You can see that in many areas. You can see it in malaria research, you can see it in the way the debt thing was handled and so on. Andrew has important links with his colleagues in other agencies, the key multilaterals Adrian has referred to and so on. We try to work very much with our international partners in this. At country level, as the Committee knows, we have a series of strategies for our various country programmes. Choices are made as to what priorities should be that we operate in those countries. I have brought with me the strategies for Ghana and Nigeria as I know you are going there shortly and climate change does not loom very large among them. We are doing work which is relevant to that. For example, no doubt you will see the work we are doing on the forestry sector in Ghana which is an interesting example, but we have to make choices at country level as to what is most important in the here and now, given our role is usually as a modest, medium-sized donor to the country concerned in response to the overall priorities that country has. We are increasingly trying to build our programmes and priorities around these poverty reduction strategies based on the experience of many years that interventions do not work unless they are seriously owned by the countries concerned. Getting the countries themselves to give the right kind of weight to these various issues, as it might be disability or as it might be climate change, is a very important part of this. We are also looking at a higher level of aggregation as to the sort of objectives we should be achieving in our programmes as a whole and our programmes in particular regions. This is linked very much in our objective setting in the Department to the international development targets and the millennium development goals. In both the White Papers we have published we have made very clear our commitment to reducing poverty and measuring our progress against these international development targets which have now been enshrined in the millennium development goals. Increasingly we are holding our programme managers accountable for the progress they are making against these quite hard edged objectives. If you look at our present public service agreement, you will see that we have quite specific targets, for example for raising the proportion of children in primary education, decreasing child mortality by very specific amounts over a period. We are in the process at the moment of designing a new public service agreement which we shall need to agree with the Treasury as part of the spending round which takes place this year and we are looking at how to ensure that these millennium development goals and these national development targets are properly rooted in our system so that we can be accountable against them. These goals include environmental objectives and as part of this process we shall need to ensure that we as a department are sufficiently credible in demonstrating programmes which deliver against the environmental objectives in the millennium goals and international development targets as well as to all the others.

7. In the Foreign Office there is a unit as well dealing with environment which informs programmes where climate change could be of strategic interest; initiatives in water management in the central European states for example. Do you have meetings with them and co-ordinate with them and liaise with them so that it is seen as an inter-departmental concern?

(*Mr Manning*) Yes. I personally feel that the Whitehall linkages in this area are pretty good but I should like to invite Adrian again to speak to this. I should say that Adrian heads our Environment Policy Department, which is where these

[Mr Battle *Cont*]

environmental and sustainable development interests come together. Adrian has in a way two key jobs. One is the international influence involved, this work with other agencies to which he has referred. That includes of course managing important things like our contribution to the global environment facility which is one of the largest single contributions we make in this area. Secondly, it is very much about consciousness raising within the Department and trying to get more understanding of these issues and greater buy-in across the Department. I may say that as one attempt to improve the way we do this my colleague David Warrilow is coming over to address our senior management committee next month and to give us an update on current scientific thinking on climate change and the way that impacts on the programme. I think that will also be a useful intervention in trying to get a better understanding among senior managers as to how significant these issues are.

(*Mr Davis*) There is very close co-operation between the government departments, tribute to that co-operation is that the Foreign Office actually changed its name to replicate ours. They were Energy, Environment and Science and they have now become Environment Policy Department. Before I reply on the specifics, may I draw your attention to an omission in the memorandum. We should have mentioned, and I thought we had, that we have launched a major study on the impact the climate change may have on the millennium development goals, how it might affect the millennium goals. It is a consultancy study. We agreed consultants towards the end of last year and we are having our first steering committee meeting next month. When we discussed this within DFID about six or nine months ago at the genesis of it, we got a lot of interest—unusually I have to say—from our geographical programmes and from other sectoral specialists. This kind of long-term strategic thinking is a relatively new construct, climate change is also a long-term issue. The combination of the two engendered quite a lot of interest. The consultants we have engaged are a consortium from Environmental Resources Management (ERM), but other partners include the Liverpool School of Tropical Medicine, the Institute of Development Studies (IDS), the Meteorological Office and Oxford Policy Management. It is in its early stages. We have agreed terms of reference, we have agreed the first phase work. It is going to be a relatively long study over a couple of years and it is going to be broken into three phases. If the Committee is interested, we shall make available the terms of reference and our assessment of what we hope to achieve in the first phase. We will do that.[1] The other thing to say is that there is not much significant difference between the set of International Development Targets and the millennium goals except with respect to environment. We have quoted the Millennium Development Goal in the memorandum, but it is a significant difference because it talks about integrating the principles of sustainable development into country policies and programmes and reversing the loss of environmental resources. That is different from the IDT and it is worth saying why it is important, because the IDT statement of a national strategy for sustainable development in all countries acted as a barrier to integration. People did not understand why there should be a separate strategy, what the genesis of the strategy was. From our point of view the Millennium Development Goal is very important. Our public service agreement talks about incorporating the principles of sustainability in ten key partner countries. It is the public service agreement that we are using as part of a kind of carrot and stick approach—we do not really have any sticks in DFID of course; it is mainly carrots. A key thing is to try to create incentives for people to do things, not really force them to because it does not work, but, within the public service agreement we have agreed with country desks that there will be 11 key countries that we will specifically concentrate on working with in looking at incorporation of environment, sustainable development and climate change as part of that nexus of issues. It is not in the memorandum, but from memory the 11 countries are Kenya, India, China, Russia, Uganda, South Africa, Zambia, Mozambique, Malawi, Nepal and Ghana; a heavy preponderance on Africa, which reflects the number of PRSP processes and incorporation of environmental considerations; the two big emitters and obviously very influential players on the environmental scene, India and China and of course Russia. It gives us an ability to discuss and take forward some of these issues with country programmes who profess themselves willing to do this and that is of course very important.

Mr Colman

8. I am assuming there is a twelfth country, which of course is the UK. I see you list them in your annex as one of the five countries which you are working on. In showing the weakness within the millennium goals, in terms of dealing with issues of climate change and sustainable development and the need to unpack that and to get more specificity there, do you think that one of the goals which should be at the Rio + 10 summit on sustainable development in Johannesburg this year should be to split out and have more detail in terms of the millennium goals rather than the rather weak goal which is there at the moment?

(*Mr Davis*) There is this famous road map behind the millennium development goals which talks about specific actions. You cannot really quantify this Millennium Development Goal, which may be both an advantage and a disadvantage and any environmental issues need to be looked at on a country specific basis. There is no real substitute for taking the millennium goal as a call for action and using that to influence and persuade people that these issues are important and of course to unpack the issues relevant and relative to what the country circumstances are. There will be further discussions within the UN system. I am not sure WSSD will do that unpacking because it needs to be done in a country context and ideally in the context of the PRSP kind of negotiations.

---

[1] Not printed. Copy placed in the Library.

[**Mr Colman** *Cont*]

Mr Colman: Might I suggest that every single millennium goal needs to be done on a country basis and there is a need to get measurability but clearly evidence we have had so far is that there is measurability there. I shall leave with you the thought that we have 6 months to go and one of the things which could be there is that the world has within the millennium goals some sort of measurability on climate change and sustainable development.

Mr Worthington

9. I understand when you were asked how much you had committed to climate change you found it a difficult question and called in consultants and they identified perhaps £200 million which could be devoted. It is a perverse question in a way but do you not think it was right that you should have found it difficult?

(*Mr Manning*) Yes, I do and I have looked at this consultancy study and I am not sure that this is quite the right approach. I say that because I do think that many of the interventions we are seeking to make are interventions which are going to strengthen resilience to climate change and I slightly resist the idea of drawing a line round something and saying this is relevant to climate change and that is not. To my mind educating girls is relevant to climate change. These things are all going to help developing countries become more resilient to the kind of pressures on them. I strongly believe in the work Amartya Sen did on famines and Amartya Sen famously said that famines are not caused by shortages of food but are caused by lack of democracy. That is right. We have seen in many countries that when there is information, when people actually think about the environment, when there is an opportunity to challenge governments, when you change systems, this is extremely important to how issues are dealt with. I rather resist the idea that we should have a package of things with a boundary round it called interventions to do with climate change. That is not to say we should not be doing things which are important, for example working with the G7 on the pilot project for conservation of Brazilian rain forests, something which is highly relevant to mitigating climate change. We are funding a programme in China with the World Bank which is going to be quite substantial and will essentially improve energy efficiency in China which is one of the key interventions. You will see in the memorandum that one of the most striking developments over the last 15 years is that the energy efficiency of the Chinese economy has radically improved. We are doing things which are directly relevant to this but I personally feel the most important thing we can do is to promote pro-poor development, particularly as poor people are the people who are going to be most vulnerable to all this. If we can make fewer people poor, there will be less vulnerability to climate change.

10. So any recommendation which came out of this Committee to establish offices or departments for climate change would be counter-productive.

(*Mr Manning*) We certainly need capacity essentially to understand the climate change agenda, to inform ourselves about the climate change agenda and to invest sufficiently in the underpinning research to understand what is going on. We do not need to be experts in all this ourselves, but we need to have access to the expertise which David and others have and we need to use that to shape the programmes and to encourage the way people think. I would not myself counsel the Committee to recommend a certain proportion of the aid programme to deal with climate change, any more than I would encourage you to do that for disability or AIDS or any other subject.

11. I was struck by what Adrian said about the way you got organised before. You had environment in a box and the fact that it was in a box was preventing environment having an impact. You said something like that.

(*Mr Davis*) I would argue that the climate change expertise in the way Richard has mentioned does reside in the Environment Policy Department. What happened was that we were much more focused three years ago on the international negotiations, not just for climate change but for biodiversity, etcetera and we had rather assumed that environmental issues were adequately integrated into DFID programmes. We had an evaluation report which suggested that was not necessarily the case, so we tried to change our efforts to look at how we could be seen to be more credible by trying to mainstream these environmental issues within DFID. It has not been in a box. We lead on general environmental issues, but we can only do so in co-operation with country programmes. One of the most important issues is to raise the level of environmental awareness among DFID staff as well.

12. I can see the desirability of mainlining environmental issues, but do you not sometimes have to do the opposite thing which is to say that this is not for us, this is going beyond what DFID can do. This is for multilateral activity, it is for European activity, it is for the World Bank, for other people to be tackling because this is expanding development on a country basis beyond what it can cope with and we need other people in there.

(*Mr Manning*) That is certainly true and a key observation of the first White Paper in 1997 was that there were very severe limits to what Britain could do on their own, but there was a great deal we could do in working with our international partners. This is a classic case where that is true; it is particularly true of the science. The IPCC has been a very important investment of the global community in a general understanding of the science and a common understanding of the science. It would make no sense to do that on an individual country basis. Equally we certainly do not believe and our Secretary of State does not believe that we should be doing everything in every country where we are operating. We have to be selective as a matter of management and common sense. What we need to help our partners to ensure is that the right kind of attention is given to the longer-term issues when very naturally a lot of our partners are focusing very much on the next six months.

[**Mr Worthington** *Cont*]

13. It does seem to me that it is a very, very important issue, if there is a problem about desertification or water management and so on, to get the right international response rather than the right British response. How do you feel about that?

(*Mr Manning*) In some areas there is a very strong underpinning for it. The international research institutes for agriculture, of which Andrew is the greatest living expert, are a very important part of this in that particular area. I do not know whether David has any observations about the way in which it works on the international scientific side, but my impression is that that is quite constructive.

(*Mr Warrilow*) I could say a little bit about the IPCC process where internationally scientists are brought together to assess what research has been done. It is important to bear in mind that IPCC does what is already there and it builds upon the work which is funded by different countries individually. We fund quite a lot of research in this country and a lot of that research finds its way into the IPCC process. An important point to make is that the IPCC tries not to get involved in the politics of climate change so that it does not deal with specific countries but deals with the regional and general aspects of climate change. Specific examples can be found in the reports but at the summary level it draws on the general approach. At the end of the day it does not put any new research into the system other than assimilating and reviewing what is already there. To develop the science it has to be done at country level or regional grouping level.

(*Mr Manning*) Another very important part of the multilateral establishment has been both the Montreal protocol work and now of course the global environment facility and Adrian is leading on the replenishment negotiations for that. The thing for the Committee to keep an eye on over the next few months is how those negotiations finish up. We certainly believe strongly in a multinational approach wherever possible. That is one of the reasons why we built this alliance with the UNDP, World Bank and European Community, together an important player, in an attempt to get the whole international system thinking the same way.

14. Another question I have is about environmental issues and particularly climate change being given sufficient weight in country strategy papers. Could I take it that the ten countries you have mentioned which are becoming involved are ones where environmental issues are specifically highlighted in country strategy papers? Or is this a general issue?

(*Mr Davis*) There are both country strategy papers and annual programme performance reviews. Increasingly I would expect the fact that these countries are focus countries for the PSA would lead to a requirement to start reporting in the APPRs each year against the PSA targets. So yes, there will be a linkage within those papers.

(*Mr Manning*) I should perhaps explain the system for you. We write country strategies on a three- or four-year basis. I was glancing at the Ghana one, which is really quite out of date now as it is a 1998 document but there is presumably about to be a new one. We now have a system where for all significant programmes there is an annual programme performance review which, unlike these, are not published documents but they are important internal management documents in which among other things we assess how each country programme is performing against the objectives which have been set in the CSP. We adjust those objectives when it seems sensible to do so ahead of the next main country strategy and we do look at how that country is performing against the various targets in the PSA including the environmental one. This is a process which has started over the last 12 months. We shall see a greater focus in those 11 countries in the direction we are talking about.

15. So in the second wave country strategy papers the environment is bursting through, is it?

(*Mr Davis*) I have not seen many country strategy papers recently. I am not sure what the cycle is. We may be in a kind of fallow period for the production of the major country strategy papers. I would expect it to be highlighted in the 11 focus countries at least. May I just add one other thing we are thinking of doing? Because the poverty environment paper joint production has been well received, the European Commission suggested that we might like to try to replicate that for climate change and we are actively pursuing that as an idea. We have not had comments yet from the World Bank/UNDP but it seems to us a sensible thing to try to do.

Chairman

16. May I ask a rather boring machinery of government question? This year we have Rio + 10 at Johannesburg. Who in the machinery of government is responsible for working out policy on that, working up objectives? Who leads? Which member of the Cabinet leads? Am I right in thinking that so far the only heads of government to have committed themselves to attending Johannesburg are our Prime Minister, the Prime Minister of Luxembourg and the President of Venezuela? Does DFID have policy objectives for Johannesburg and what are they and how do they relate to what we are discussing this morning?

(*Mr Manning*) Government is indeed developing and has developed a core script for Johannesburg. There is an inter-departmental process which is led at official level by DEFRA. To my mind it works pretty well. There is also a ministerial process which involves the Deputy Prime Minister, the Secretary of State for the Department for Environment, Food and Rural Affairs, the Foreign Secretary, our own Secretary of State and other departments in the usual way and which has now had a couple of meetings and will go on meeting regularly in the run-up to Johannesburg. Adrian, do you have an update on which heads of government are coming?

(*Mr Davis*) The Foreign Office have done a lobbying exercise. There is some doubt but I think Putin has also said he will attend. Most people are saying it is too early in the replies we get to telegrams etcetera, but they are confident their Head of State will attend. Those are the only ones who have formally accepted.

(*Mr Manning*) My impression is that there will be quite a lot of heads of state and governments there, but it is a bit early in the cycle to be sure. What is

[**Chairman** *Cont*]

certain is that the British Government are taking this event seriously. We see it as quite linked to the Financing for Development event which is taking place in Monterrey in March; the same issues will come up in both. Some of these issues will be revisited at the Kananaskis summit which falls between the two and the various departments concerned with all these events are very much in touch with each other and trying to adopt a consistent policy through the whole cycle of events this year.

Mr Colman

17. Taking us back to the big picture, what do you see as your prime approach as DFID for dealing with the effect of climatic disasters and long-term climate change? Is it adaptation, mitigation or population displacement? Which of the three is really your mainstream forward?

(*Mr Manning*) It is a very important question. I was reflecting as I was thinking about this on the way we deal with AIDS, where again the issue is how much is trying to operate on the prevention side and how much is dealing with the consequences. What we do not do in either case is say we are going to spend this much on AIDS and decide *ex ante* that we are going to spend this much on prevention or research for a vaccine and this much on curative measures. We try instead to optimise mainly at country level what interventions are most useful. Obviously mitigation is very important. I have referred already to the significance of what has been happening in China. To my mind the most important single mitigation factor is the appropriate pricing of energy. The Chinese example shows that very clearly. What has happened in Eastern Europe shows it pretty clearly as well. We need to reduce the energy intensity of production and this is a very wide agenda. It involves lots of new investment, it involves new technology, it involves in particular giving consumers, including notably industrial consumers, the right kind of price signals so that they take sensible investment decisions over the medium term. I have given an example where we are working on that with the World Bank in China. There is quite an agenda of both energy efficiency type measures but also—and this is not captured in the statistics—as you work through poverty reduction strategies, as countries increasingly realise that they cannot afford environmentally unsound subsidies, of which there are many in developing countries, then the energy intensity of production will gradually fall. As long as people are getting energy at very low rates or are being inappropriately subsidised you are not going to see much progress. That is probably the biggest single area, although it is by no means the only one. There is a huge agenda in forestry for example and so on. On adaptation, it is quite clear that adaptation not only needs to take place, but is taking place. People do adapt. I was just being told as I came into the room of a very interesting example in Bangladesh where the loss of life in comparable sized cyclones has fallen very dramatically. Over 300,000 were killed in the events in 1971; something like 100,000 were killed in the event in 1991 and round about 100 killed or something like that in a very comparable event in 1998 and that is because there has been an investment in cyclone shelters, there has been an investment in prevention, people have learned to their cost that they need to heed the warnings. There are better communications and you cannot entirely make it like with like, but it is clear that Bangladesh, because of sensible investment, has made itself somewhat less vulnerable to some of these events than would have been the case even ten years ago. There is a lot more that can be done in this way. For example, we are funding a study to look at the likely impact of climate change on our own overseas territories. This will help the overseas territories consider what they themselves can do in our support to make themselves less vulnerable to climate change. We see that as a sensible investment for many countries. As I have said already, a key part of adaptation is building on things people should be doing anyway and on a lot of the things that need to happen. If you adopt the kind of livelihoods approach that we tend to adopt when we look at area based development, if we are dealing let us say with the rain fed areas of India, where we have quite some experience now, the rain fed areas of India are a classic case where they will become more vulnerable to climate change because rainfall patterns will become more erratic, maybe droughts will be longer, some of these issues about the kind of crops you grow, some of these issues about how far you depend on agriculture and how far you develop other means of livelihood strategies become very significant. As we develop programmes, for example in the tribal areas of Orissa, we have to look at what the main risks to people are, including the risks arising from climate change. So there will be a series of interventions which you will see around the globe which will reflect the way in which the variability we can see already in the natural environment—and our perception of that variability is going to grow—should be informing the way projects are designed.

18. In a sense you have answered the rest of my question in terms of looking at project and programme evaluations within DFID. May I ask a tangential one? I was interested in your first reply which was mitigation and dealing with energy policy. To what extent are you involved with the OECD convention on export credit agencies and environmental considerations where there is an attempt by the United States to ensure that renewable technology exports get priority over fossil fuel energy technologies, something the UK Government has as yet not backed in terms of signing that convention? Do you get involved when there are in fact export credit approvals for fossil fuel energy technology exports to developing countries? Do you get consulted on that? Do you take an active interest in that?

(*Mr Manning*) It is down to the Export Credits Guarantee Department and their sponsor ministry which is the Department of Trade and Industry to take decisions on export credit cases, as you will know from looking at dams in Turkey for example. We have advised ECGD on approaches they might adopt to looking at environmental consequences of export credit but it is for them to take these decisions and to look for advice where they can find it. If they come to us we will help to put them in touch with useful sources of expertise but it is their decision to do that. We certainly strongly support, as indeed do

[Mr Colman *Cont*]

they, the idea of getting better environmental understanding into the export credit business, but I am not aware of the specific distinctions being made here between renewables and fossil fuel exports. I am not aware that there is a proposition which would in any way ban export credits for fossil fuel projects.

19. Not ban but would certainly give less priority to them and less help. Could we have a note in terms of what DFID and DEFRA are doing in looking at this area on a cross-government basis, dealing with the need to move to less CO_2 emitting energy technology with developing countries?[2]

(*Mr Manning*) You will be aware that there was an exercise in the run-up to the Naples summit looking at renewable energy and there is ongoing work in Whitehall internationally on how to promote sustainable renewable energy. The economics of renewable energy continue to improve and they are expected to improve further over time. There remains an interesting question as to the case for a degree of public subsidy to enhance the take-up of such technology.

20. Obviously in this case the public subsidy is through the ECGD. You have talked about country by country need to adapt and need to strengthen local adaptive capacity. You talked about finance ministries. Are you working with the local academic scientific community in the 11 countries? We were told by our advisers at the beginning of this that it was very important to encourage the bases of local expertise in developing countries, scientists who understood what was going on within their country. To what extent are we helping local capacity to forecast seasonal and longer term climate changes?

(*Mr Manning*) That will certainly be a feature of the work I described in Bangladesh. Do you have any other examples, Andrew, which you would like to bring to our attention?

(*Mr Bennett*) We have not done a lot specifically in this area. We have engaged through the Consultative Group on International Agricultural Research where we are a member, along with 50 other countries, to try to develop programmes which will be carried out not only at the centres but working within national systems as a means of trying to help countries better understand the likely impacts and what they might do about it. There are various other activities which are involved in trying to strengthen national capacities in all fields of agricultural and natural resources research. Nothing specifically targeted at simply the climate change area. There is a feeling here that the general science base and the general academic base and the research capacity in countries, as we have described earlier, can find their way into the energy sectors, find it into the forestry sectors and natural resources sectors. It is important that the capacity exists in those areas in order to cope with these consequences.

21. Would you see it as important that more research is done by developing country economists or scientists within those countries so they would be able to take more ownership of what is happening within their country?

(*Mr Bennett*) Absolutely. I think my colleague from DEFRA has an example from India.

(*Mr Warrilow*) DETR started two projects, one in India, one in China, to look at the impacts of climate change. They both started last year and will run for two to three years. The Chinese one particularly has a strong element of training because the Chinese were very keen to have links with UK institutes so a number of Chinese scientists are actually coming to work in the UK for three months or so as part of the training part of it. The Indian project is an ambitious project and covers all aspects of climate change impacts and will be executed by Indian scientists with links with some UK scientists as well. We are looking at that aspect from the wider climate change policy aspect rather than development side of things. The Hadley Centre has also been preparing a regional climate change model which can run on a personal computer, which is being designed so that it can be run in developing countries—it can be run anywhere actually but the main aim was to allow developing countries to run a sophisticated climate change model themselves. We have already been working with a few countries—DFID are aware of this and are part of the project—with Bangladesh, with South Africa—there is a South African scientist at the Hadley Centre—with China and with the Indian projects as well.

22. As the Hadley Centre is based in Norwich, is there a cross-over —

(*Mr Warrilow*) It is in Bracknell.

23. Sorry. I thought there was a centre for developing research on climate change which was based in Norwich.

(*Mr Warrilow*) That is the Tyndall Centre.

24. How does the Tyndall Centre fit with dealing with the research base in developing countries?

(*Mr Warrilow*) I am not totally familiar with what the Tyndall Centre are doing on this because it is not part of our programme. I believe they do have links with some developing countries, but I do not know the details.

25. Perhaps you could give us a note on how the two centres work together.[3] Certainly when I visited there shortly after set-up they saw themselves as being the main research hub in the UK for dealing with climate change world-wide. You have not actually mentioned the impact of climate change on small island states. It has not been the emphasis of what you were saying. Is there a world-wide emphasis on the impact of climate change on small island states and what is your feeling in terms of the balance of research which is going on?

(*Mr Manning*) It certainly is a very important issue. I mentioned the study on UK dependent territories which we certainly think is relevant to other small island states.

(*Mr Bennett*) Needless to say the small island states are extremely vulnerable, particularly the low islands. A lot of work was done through the Commonwealth prior to the Rio meeting where the small island states formed a group and a very strong lobby group and they are very active in a lot of negotiations. They remain vulnerable. The fragility

---

[2] Ev 37.

[3] Ev 35.

[**Mr Colman** *Cont*]

of low island states and their freshwater lens in the coral is such that if climate change is significant some of them will become uninhabitable. You asked a little earlier about the issues of migration. It is already happening. In West Africa the extent of migration out of the Sahel from Mali and Burkina Faso into Ivory Coast is such that they are now introducing legislation to prevent foreign nationals from owning land. They form a significant proportion of the labour force in the cocoa and other plantation industries and in the construction industries. Migration is happening and if small island states do start to dry out, there will be migration. Our Secretary of State has been fairly active in that field. Richard, are you familiar with the whole issue of migration?

(*Mr Manning*) That takes it into a rather wider area. I have certainly seen press articles about some Pacific islands who are canvassing their options with Australia and New Zealand in the event that they are unable to sustain their present levels of population.

Chairman

26. Part of this is just how urgent one considers this all to be. Going back through this evidence, you quite rightly have said DFID focuses on poverty, the better you can tackle poverty the more resilient you will make the countries in tackling climate change. The evidence we had from the Hadley Centre is pretty scary. I do not know whether you have had the same presentation we had but it certainly made us all sit up and take note. What they are really saying—colleagues will correct me if I have got this wrong—is that they expect to see greater changes in the climate over the next 100 years than has taken place over the previous 400,000 years. I just wonder whether there is sufficient—this is not a criticism of DFID just generally across the scientific and international consensus—urgency in appreciating the potential scale of change which is going to occur over two or three generations.

(*Mr Manning*) It is a very hard question to answer. I am sure that the advice of the Hadley Centre is very well grounded and it certainly informs the way we think about the longer term. In a way the Department is bound to think about the longer term. Our main targets are set for 2015 but 2015 is tomorrow in climate change terms. The climate is not going to be radically different in 2015 from what it is now. Naturally we do tend to focus on things which are going to do something about child mortality, about AIDS, about governments, about things we can do in the here and now but we need to do it very much against a background in which the world is going to have to cope with the biggest climate change it has ever seen in a century when the world population is going to peak. There will be more people than there have ever been. This is a major long-term challenge to all of us which certainly needs to be factored in. The question is whether we should be doing something different in the here and now from what we are already doing. I hope you have the sense from here that we are certainly concerned about the issues. We certainly recognise the need to encourage our colleagues to take more of a medium-term perspective. What I am less certain about is whether there is something radically new and different that we should be doing—you are about to go to Ghana—differently in Ghana in the here and now, given that we obviously may expect a yet drier northern Ghana in the next 30 or 40 years. Those are the kinds of issues on which the Committee's own thoughts will be very useful when you have done that. I do not want to sound complacent about this but there are many things which people need to do anyway, and my own sense is that we really have to pursue various kinds of no-regrets policies. If we do not have governments which function, if we cannot get on top of a regional conflict, if we cannot get people educated, we are not going to succeed in any of these things so we have to go on investing in that, but we should do so, in particular when one puts in place longer-term investment, hydro-electricity or whatever, taking really serious account of the fact that models based on past precipitation are going to be an increasingly unreliable guide to the future. As we are pretty well not investing in any hydro-electric development that is perhaps not a very operational question for us these days.

Hugh Bayley

27. May I take you back to paragraphs 2 and 3 of your memorandum, which run through some of the difficulties in mainstreaming environmental policy in more general policy? You have given us some good examples of where DFID interventions have got it right and where developing countries have managed to tackle environmental problems effectively, but you list here a number of problem areas: insecure ownership of resources means that people do not safeguard them very well, you talk a little bit about taxation, low level of public awareness. Can you give us some examples of bad practice? Why do things go wrong? Where have things gone wrong? What illustrates these market failures, policy failures, institutional failures?

(*Mr Manning*) I will ask my colleagues to be thinking, as I give a first response, of one or two other examples they could pick on. There are some very interesting ones in what has happened to pastoralists in Africa, what has happened to forests in many areas. The example I reflect on sometimes is the danger that people reach for technical solutions when in fact the issue is a wider one. In particular, after the very severe flooding in Bangladesh around the end of the 1980s/early 1990s there was a big international effort, led unusually by the French, to see whether there was some way of corralling the major rivers of Bangladesh and making Bangladesh less vulnerable to flood. It started off with a rather naive idea in some people's minds that you could pour a lot of concrete and you could pretty well canalise the world's largest rivers and construct something which looked hugely attractive to major construction companies. When this was looked at seriously, it became evident the more it was looked at—and I remember going to meetings with people from the Mississippi River Commission who had worked on this sort of thing for years—the more it was apparent this was completely the wrong approach and that one had to allow water to move across the face of Bangladesh, being a delta. Instead

[**Hugh Bayley** *Cont*]

you had to help people cope with it. In fact a number of very low-tech and uninteresting-to-construction-companies things could be done which were definitely worth doing and which I understand to a large extent are being done in Bangladesh. You do have to beware of one-size-fits-all solutions to these problems. You have to look at everything very much in terms of local specifics and you have to understand—this is crucially important—the social dimensions of these problems, why people act in the way they do. As we said in our target strategy paper and elsewhere, on the whole it is not the poor who cause environmental damage and when they do cause environmental damage, it is often because of the way the local system is rigged against them: difficulties of common property access, difficulties of breakdown in traditional systems which were sustainable, of handling common property resources. May I invite Andrew to give a couple of concrete examples where the world may have got it wrong and where we could do better in future?

(*Mr Bennett*) There are some examples of where it was got wrong and then got right. If you look particularly at issues of tenure and ownership and management, in Nepal they nationalised all the forests. Net result: it was open season on the forest. They denationalised the forest, communities took over and the forests are much better managed and those community groups have not only become better at managing the forest in ways different to the ways of forest departments—they are not managed for timber, they are managed for all the other goods and services, fodder and other things—they have gone on beyond that to start looking at water management and other asset management. There is an example of where there was a failure of policy, but a redemption largely because the Government of Nepal let it happen. A lot of the destruction of the world's forests is not being done by people who live within them and depend on them, they are being done by external forces often outside the laws of the land. There is considerable corruption and incompetence going on in many parts of the world. In a country like Indonesia they suddenly—as a result of a study done by EC and ourselves—realised the massive amounts of income they were losing from the fact that the forests were being exploited but the income was not coming in. There we have embarked upon a process of governance reform where increasingly responsibility and ownership and regulation of forest is being devolved back into communities. There is another example of where tenure is important; the land tenure in many parts of the world becomes an increasingly important area. You have other areas where environmental damage has been done. Take Thailand about 30 years ago when the price of cassava went rocketing up and all the land was taken out of forest and other products and simply put into cassava chip units. Fortunately the market for cassava chips collapsed and people went back into better land management. One is often seeing at a community level that when environments are being managed for the benefit of those communities they are often managed better and more sustainably. It is when external forces come to bear either through corruption or changes in tenure or weak governments that you start to see damage coming.

(*Mr Manning*) One other thing relative to this is that one has to look at the perverse effects of subsidies and often our own policies. The cassava example in Thailand took place solely because of a particular quirk of the Common Agricultural Policy which created a very strange incentive to send cassava to feed the cows in Holland. Similarly the Committee might well want to reflect on the way in which the fisheries policy of the European Community is in some ways inimical to the sustainable management of fisheries in several parts of the world, particularly to the interests of poor artisenal fishermen. There are areas where we need to look quite carefully at the policies which we in the European Community adopt and make sure we are not putting in place subsidies and other distortions which lead to unsustainable exploitation.

28. Would that be Namibia you are thinking of in respect of fishing?

(*Mr Manning*) There are several countries.

(*Mr Bennett*) We could send the Committee details on a programme we are involved in across the whole of West Africa on the better management of the fisheries of West Africa and strengthening governments not only to manage fisheries for themselves but also to try to resist some of the predatory habits of distant water fishing nations in those areas.

Hugh Bayley

29. One of the things we should like to see is DFID leading or participating strongly at least in an international discussion about these issues. We are better able to do that if our own performance is good. Perhaps you could send us a note about the cassava, just a couple of paragraphs, starting from the DEFRA angle and why in agricultural terms this seemed a sensible thing for the EU to do and why there was no audit of the consequences further away.[4] This was some time ago and hopefully things will be better and you could perhaps show that a lesson was drawn from that. One of the things which you stress it is important to do is to improve public awareness of environmental issues and to encourage people to think longer term, which is extremely difficult for people throughout the world. You think about the here and now and the more marginal your existence the more immediate your concerns. I was very struck by a comment in your paper that a greater proportion of the burden of disease in developing countries is associated with environmental factors, poor air quality, poor water quality and so on than as a result of malnutrition. It did strike me that maybe health, which is something which has a more immediate impact on people, could be used as a public awareness vehicle for linking environmental problems with human consequences. Do you agree and if so how would you use it as a vehicle to make people focus on the importance of having cleaner air in urban areas, cleaner rivers and so on.

(*Mr Manning*) It is certainly one of the key factors which people relate. We have done this work on what people themselves feel about the environment. The World Bank did a kind of voices of the poor study

---

[4] Ev 35.

[Hugh Bayley *Cont*]

which we helped finance for their world development report last year and we did a kind of follow-up on the environment. It demonstrated how important the poor people consider their environmental factors are and certainly includes clean water and access to water along with many other things. There is controversy about the extent of some of these things. There is more than one view as to exactly how significant indoor air pollution is but there is no question that environmental factors are a very significant part of the total disease programme. We probably could do more to encourage that to be highlighted. Another thing which may help us here is the Internet and all that goes with that. Getting information is a rapidly changing field. We are looking quite seriously at better use of things like community radio linked into the Internet as a means of getting messages around. Health and environment are good examples of what might be done there. There is a UN task force on ICT and I am going to attend their next meeting to see how useful some of this is. They are certainly looking among other things at the way in which information technologies can be better used in the health field. We shall see how far that takes us. Certainly the whole question of awareness raising is very important to this. Andrew and I both having lived in Thailand at different times have seen the way in which, as you gradually develop more of a middle class that can reflect on these things, some of these issues move up the local domestic agenda in a way which was not the case. It is very difficult for poor people who are struggling from day to day to have that kind of leverage. As societies change, and societies are changing very rapidly in developing countries, you do see greater coalitions of people who are interested in environmental matters and are increasingly trying to hold their governments to account for some of the more difficult environmental issues in their countries.

30. To what extent are mitigation policies and adaptation policies integrated? How can local livelihoods approaches both in relation to adaptation and mitigation be linked with national strategies and policies?

(*Mr Manning*) This is a very important conundrum, particularly the second half of this. At local level we are becoming better at looking at how livelihoods can be improved, but feeding that back into central government policy is a big challenge. It is one where donors such as ourselves have a particular role to play in helping to highlight these things. A lot is going on. In a country like India there is a long tradition of a lot of community action and community activists who in some ways highlight these things quite effectively. That is less the case in many other countries. Well considered donor supported interventions can help inform central policy, but there is a lot of work to do in this. I would not claim that we are more than at the start of that agenda. An area where it is being tested more than most would be for example forest policy in Brazil, where it is obviously a very important national issue and where the British contribution to the whole debate about Brazil's forest has been very much about how to manage the interaction of people with the forests and that has perhaps been the area we have focused on. Andrew might want to say whether he thinks we have been in any way effective in feeding back the results of what we have learned at field level to Brazilian Government policy.

(*Mr Bennett*) It is very interesting working on the livelihood side. Once you start to try to go through the cycles between what people's assets are and what their options are and where they would like to be in a few years' time how often we come back to central institutions legislation and regulation and how often the ways in which governments ise organised is not necessarily perfectly structured in order to deliver a multiple range of goods and services to people whose attitudes and aspirations are changing. In terms of Brazil, the first task was creating effective links between the central government and the governments of the individual states and putting in place the means by which those two could relate to each other and in turn then relate to local communities. Often you cannot come up with a nice grand design at the outset but you have to start doing things to identify where the gaps and where the problems are. One thing which comes out of a livelihoods analysis is how important it is for societies and communities to get into the business of asking what they want from others. If you take a country like Uganda, where the government has accepted this as important, it is actually putting money into the local communities to buy what they want in terms of research and rural services back from central government. This is a rather interesting approach to recognising how important it is that local communities are engaged in the process. To answer the first part of your question between mitigation and adaptation, when you are dealing with different communities, you actually find they are in rather different parts of that agenda. For example, in terms of mitigation there is land use and land protection and where they get their energy from and how they get it. In terms of adaptation it is how they cope with drought, temperature and various other things. In terms of getting the balance right, if you start with the communities, often in many parts of the world in which we work water is one of the limiting issues and the first thing they want is reliable water supplies, not only to drink but for their crops and their livestock. Land and water management issues become a priority. Improving land and water management actually increases the vegetative cover, which in turn helps to absorb carbon. It is funny that once you get into the realities of the day-to-day doing how many of these things are interwoven.

31. Given that the focus of our inquiry is on climate change rather than a wider environmental agenda, measurability of many environmental factors and considerations is extremely difficult but in relation to climate change it is probably easier, is it not, in that you could select two or three measures, for instance energy use is one mentioned earlier, possibly certain agricultural practices? I was very struck by an American paper which said that in a two- or three-year period recently China had achieved 15 or 18 per cent growth but with a negative growth in energy consumption. Could you not use measures of national energy consumption simply as a measure of whether development policies are sustainable or not?

[**Hugh Bayley** *Cont*]

(*Mr Manning*) Certainly energy intensity of GNP is a very useful indicator to track. You have to recognise that clearly countries in different parts of the world and countries' different resource environments will come up with different points on the scale but you can certainly see movement. I do not know, David, whether there is any internationally recognised set of indicators that you would particularly advise the use of.

(*Mr Warrilow*) I believe there is but I am not familiar with it. One thing worth pointing out is that each country under the UN Convention on Climate Change has to report a whole range of issues to do with greenhouse gas emissions and so on. There is probably quite a lot of data now coming together which you could use to assess impacts of other activities.

(*Mr Davis*) As a sub-set of the IBRD's world development indicators over the last two years they have been producing a little green book which lists environmental indicators in all the countries. We will give the latest copy to the Committee, if that would be helpful.[5] They are tracking these kinds of issues by each country.

Hugh Bayley: My final thought to leave with you is that maybe you ought to winnow out of these various statistics some which would be appropriate measures which you should feed into your country strategy papers or your road map so that they are things with which you monitor your development spending against countries' performance on energy use or agriculture, methane production or whatever might be appropriate indicators.

Mr Robathan

32. I want to take you back to the issue of agriculture and the impact of the developed world's agricultural policies and fisheries policies on the developing world. This was brought up by BOND when we interviewed them and they said that the one issue which really concerned the developing world was the liberalisation of agriculture. We have just had the Doha meeting. How confident are you that the issue you raised of the CAP and the common fisheries programme will be addressed? What input does your Department have into these discussions on those specific issues?

(*Mr Manning*) You have seen the Doha text on this which went to the wire and was very carefully considered. It is quite clear that agriculture was one of the main subjects being discussed. It is already being discussed as part of the built-in agenda at the Uruguay round and various deadlines are built into the Doha agenda which we will need to work to. There is no question: these issues will be discussed but people still have their negotiating cards turned into their chests at this stage. On the second point, I personally regard the way in which the CAP reform does or does not take place as being one of the key issues for us as a development department and we shall certainly be working very closely with our colleagues in an effort to ensure that the development dimension is fully integrated into British Government policy.

Tony Worthington

33. One thing puzzles me and that is that no-one is mentioning UNED at all. Is this considered a relevant body to this whole area?

(*Mr Davis*) UNED UK is an NGO which has looked at WSSD in particular and has a track record there. It has both an international and a domestic dimension in raising awareness. We have given them some money to facilitate attendance by southern NGOs at international meetings but we do not have a strong relationship with them. They mainly relate to DEFRA on WSSD issues. From our point of view they are a UK NGO.

Mr Colman

34. I do not believe we have covered the direct results of COP7 Marrakech and the Kyoto Protocol. You mentioned the clean development mechanism and how that was working in Bangladesh potentially. Within the Kyoto Protocol there is the framework for building adaptive capacity for developing countries and countries with their economies in transition. Do you believe that the frameworks which are within the Kyoto Protocol are adequate and how do you see DFID being involved in implementing the framework coming from the Kyoto Protocol?

(*Mr Davis*) It is early days. There are three funds specifically set up under the Kyoto Protocol and the convention. The global environment facility has been tasked with working out rules and procedures for those. It is on the agenda for the next council meeting in May. The emphasis on what we have been saying about the need to integrate suggests to us that our response to climate change should certainly be an amalgam of both the bilateral and the international responses. In terms of adaptation, if you talk about adaptation as being looking at resilience of an economy, the need for a separate fund is perhaps less obvious that it might be. There is the opportunity to meet our commitments under these funds by increased bilateral spending as well, so there is a mixture. We would want to use those as a further encouragement for our country programmes to take account of adaptation issues. It is too early to decide how these funds will work and what they will finance—the additionality in terms of resources is clear—in terms of how they will complement the existing activities of the global environment facility, for example, and what bilateral donors are doing generally.

35. And the clean development mechanism?

(*Mr Davis*) There is a meeting today and yesterday of the executive board of the clean development mechanism to which we have agreed to contribute £20,000 to get them started. The clean development mechanism, as the DEFRA memorandum makes clear, is the only one which can start promptly and which developing countries can benefit from. The likely benefits from the CDM are lessened by the fact that the US are not participating, so that has rather

---

[5] *The Little Green Data Book*, published annually by IBRD/The World Bank.

[Mr Colman *Cont*]

reduced the attractiveness. Nevertheless it is attractive to developing countries. Various issues about equity, whether all CDM projects will go to China, India, Brazil, whether there will be a better spread, are now going to be worked out over the next four to six months.

Hugh Bayley

36. The UK is arguing for an increase in funding in the third replenishment of the global environment facility. How are those discussions going? What do you think the outcome will be? If there is increased funding, what would DFID want to use it for?

(*Mr Davis*) We argued for a significant increase in the third replenishment of GEF because we saw the global environmental trends had been deteriorating, because collectively the world had asked the GEF to do other things like deal with the effects of persistent organic pollutants and desertification and more intensive work on capacity building. We thought this needed to be backed up by a collective determination that we should give more money. There have been two replenishments: the first of $2 billion, the second $2 billion. We argued for $3 billion and we have consistently argued that. We were supposed to agree on our final figure in our meeting at the beginning of last month, December. We did not do so and there is now a further meeting at the end of February in Paris and there will probably be an additional meeting. We hope that the meeting at the end of February will agree the indicative figure. The reason we have not been able to make progress is that the two countries which together account for about 40 per cent of the GEF have not been able to make the position clear, the US and Japan. Japan is also waiting for the US, so the US is the key country. The US has not said anything about its attitude to the third replenishment but more importantly has not said anything about its position on arrears to the second replenishment. The US is two years, or $220 million, in arrears on the GEF. We are promised that something will materialise in the course of this month which will make the February meetings easier, but the key issue at the moment is what the US is going to do. At the moment Japan, I guess partly for domestic political reasons but also there is a point, is exploring and asking the GEF council and secretariat to think about issues of procurement restrictions. This is a repetition of some of the discussions which were held in a previous IDA replenishment where procurement restrictions were enacted. I do not think it will actually get to that stage but we see it as useful in keeping up the pressure on the US. So far there has been no sign that the US will make the same kind of gesture to the GEF as it has done to the UN where it paid off all its arrears in one fell swoop. Again it is an education process. It is because they probably see the GEF as a Kyoto Protocol mechanism despite the fact that that is not true. I would say charitably at the moment that we are waiting to see what will happen. If you want a personal impression of what I think the outcome will be, I do not think we will get $3 billion. I think we will get somewhere in the range between $2.5 and $2.7 billion, which is an increase but in fact if you take into account inflation, take into account extra activities, it will be seen as a sort of minimum outcome.

37. As I understand it, GEF is used to build in environmental sensitivity to development projects, typically big infrastructure projects. How feasible will it be to build in a sustainability dimension to the poverty focus work which you are doing? In other words, how useful is it for things other than large infrastructure projects? I understand that there is a considerable gap between allocation and disbursement of GEF funding. Why is that?

(*Mr Davis*) On the latter, there is no big gap. Commitments are about $3 billion, disbursements are about $1.1 billion. It started from a standing start about eight or nine years ago and they financed projects and projects have five-year cycles and there are not many comparable organisations which started eight years ago. Any development organisation has a significant time lag between commitments and disbursements and I do not think GEF is out of line, in fact disbursement is picking up. On infrastructure, the basic *raison d'être* for the GEF was to add a global component to a project to add on to projects which countries were doing anyway something which would deal with global issues. On climate change, it has been concentrating on the promotion of renewable energy, reducing market barriers to entry of firms to try to encourage them to get into climate change work. It is moving as it becomes more mature—and this is one of the things we and others have been pushing in the replenishment—away from infrastructure projects *per se* to much more programme lending and dialogue with countries like Mexico, China, India, to a kind of global programme loan, to looking at global issues and to integrating global issues. We have encouraged the GEF to look at the links between global environmental issues and poverty reduction and all the things we have been talking about today suggest that work on climate change, work on global issues, on the preservation of biodiversity will help in poverty reduction, but that is probably not its primary purpose. That is slightly recognised by the fact that not all of our contribution to the GEF is counted as aid, it is about 75 to 80 per cent. Nevertheless it is a very valuable part of the international scene and we think it should be supported.

Tony Worthington

38. I just want to be clear. You used the term "procurement restrictions". Are you talking about the Japanese insisting on a form of tied aid?

(*Mr Manning*) No, what we are talking about is that the Japanese are saying if the Americans are in arrears then American firms should not have access to the procurement.

(*Mr Davis*) It is mainly consultancies.

(*Mr Manning*) This has come up in the World Bank context before. When the Americans get into arrears, and the Americans famously do get into arrears, people wonder what to do and one of the few levers you can pull is to say that in that case America cannot benefit from this until they have paid up.

[**Tony Worthington** *Cont*]

39. A sort of reverse tied aid.

(*Mr Manning*) Yes, that is right. It was done. It was done ten years ago in an IDA replenishment. Whether it is effective is something people debate a lot.

Chairman: Thank you very much for all your help this morning. It may well be that when all of us have had an opportunity to look at the transcript, we may have a number of other technical questions, and Tony Colman may have one or two, which we will feed through our Clerk, so that before our meeting with the Secretary of State we can clear as much policy undergrowth as possible and when we see the Secretary of State focus on a limited number of mainstream policy issues. Thank you very much, it has been extremely helpful. Thank you for giving us so much time this morning and taking a range of rather complicated questions. Order, order.

Supplementary memorandum submitted by the Department for International Development

THAILAND: CASSAVA AND THE COMMON AGRICULTURAL POLICY (CAP)

Cassava is a root crop, native to South America that is now grown throughout the tropics as a food and industrial crop. It is tolerant of drought and low fertility. It produces large tubers (swollen roots) high in starch. The tubers are lifted, washed and processed to produce food or dried to give cassava chips or pellets. It is a cheap source of starch and starch products.

In the early 1960s, the CAP insulated the internal prices of feed grains in Europe from world market prices through artificially set floor and ceiling prices. Cassava starch was treated differently in the external tariff structure, which made it highly competitive to animal feed makers and commercial starch producers.

Since the 1940s the Thais had developed a highly efficient production, processing and marketing structure for cassava production. The area under production rose from 700,000 hectares in 1975–76 to about 1,680,000 ha in 1988–89, falling to about 1,100,000 ha in 1998–99. Most of the increased production was located in the fragile soils of north and north-east Thailand and often on sloping land prone to erosion. The expansion of area was at the expense of natural forest. It resulted in considerable soil erosion. Water from processing plants frequently contaminated waterways through high levels of organic matter and naturally occurring cyanides released during processing operations.

Between the late 1960s and 1982 cassava imports to western Europe, from Thailand rose from 0.4m MT to over 7.8m MT.

At this stage the EU sought to reduce the importation of cassava. Because of the political and legal difficulties it sought to do this through voluntary means. Thailand agreed because of links to other trade agreements (especially textiles) and promised development assistance to help diversify agriculture in the poor north-east. The 1997 quota (for a preferential tariff of 6 per cent) was set at 5.25m MT. The negative impact of this reduction has been reduced by growing demand for cassava chips from other countries, namely Japan, Korea and Taiwan. There is also a growing world market for the higher value cassava pellets and processed starch products.

LESSONS

Agricultural and tariff policies set in Europe can have a significant impact on market opportunities and responses in developing countries.

The Thais exploited the market for cheap starch for livestock feeds as it created jobs and income. The increased areas under cassava were at the expense of natural forest and caused soil erosion.

Department for International Development

February 2002

Supplementary memorandum submitted by the Department for Environment, Food and Rural Affairs

TYNDALL CENTRE AND HADLEY CENTRE LINKS

The Tyndall Centre for Climate Change Research was set up by the Natural Environment Research Council, the Engineering and Physical Science Research Council and the Economic and Social Research Council in 2000. It aims to research, assess and communicate from a multi-disciplinary perspective, the options to mitigate, and the necessities to adapt to, climate change and to integrate these into the global, national and local contexts of sustainable development.

The Hadley Centre was set up in 1990 at the Met Office in Bracknell. Jointly funded by DEFRA and the MoD it built on climate modelling research at the Met Office. Its main aims are:

- to develop mathematical models of the climate system;
- to use these to make state-of-the-science predictions of change;
- to monitor climate change globally and nationally;
- to attribute recent change to specific causes, eg human activities.

The Hadley Centre provides a focus for climate prediction activities in the UK and makes its predictions openly available, to the Tyndall Centre, and others, such as the UK Climate Impacts Programme (at Oxford), for the assessment of impacts and adaptation response measures. The Hadley Centre also has many links with developing countries. It supplies freely all the predictions from its climate models, and these have been used extensively to evaluate impacts. It has recently developed a regional climate model for detailed predictions of climate change over any region of the world, which was funded by DFID and DEFRA. The model has already been supplied, and training given, to the Indian Institute of Tropical Meteorology. Over the years the Hadley Centre has welcomed a number of visiting scientists from developing countries including China, India, and South Africa.

The two Centres' activities thus compliment each other; Hadley Centre activities are concerned with climate science and those of the Tyndall Centre with climate impacts and responses.

With regard to the Tyndall Centre's activities in developing countries, they are committed to working with scientists and stakeholders in all parts of the world, especially developing countries. They are currently engaged in the following projects:

(a) *Measuring a country's vulnerability to climate change: new indicators of vulnerability and adaptive capacity*

The project utilises existing databases of economic, social and institutional variables to provide a comprehensive account of sensitivity and adaptive capacity at the national level for all the countries of the world for which data are available. Indicators of vulnerability and adaptive capacity should include measures of insecurity and marginalisation, distribution of wealth and assets, geographical and environmental dimensions, demographic and health status characteristics and social capital.

(b) *How do CDM projects contribute to sustainable development: evaluating policy options for the clean development mechanism—a stakeholder multi-criteria approach*

Projects implemented as part of the Clean Development Mechanism (CDM) of the Kyoto Protocol will have the dual mandate of reducing greenhouse gas emissions and contributing to sustainable development. Ambitious claims have been made about the likely benefits of CDM projects in developing countries, but these claims need to be critically assessed before investment in CDM takes place. This project will undertake a theoretical and empirical analysis of the implications of the CDM in developing countries, in particular working with local stakeholder groups in Brazil and Costa Rica.

(c) *Integrated policy making in managing climate change: linkage between climate change and trade policies*

This project focuses on a topic of increasing concern, the potential for incompatibility or conflict between the multilateral trade rules, including investment regulation, and the flexibility mechanisms adopted under the Kyoto Protocol. Supporting organisations are the British Council and Shell International and the case study is South Africa.

(d) *Adaptation to climate change in developing countries: policy responses to enhance resilience in Bangladesh*

The objectives of this project are: to examine the nature of the threat of global climate change to sustainable development and livelihoods in poor countries, using case studies in Bangladesh; to explore how lessons from coping and adaptation to environmental change in other situations (particularly drought) can be applied to understanding and identifying responses to impacts of climate change, such as flooding and cyclones in Bangladesh; to identify what measures can be taken under the UN Framework Convention on Climate Change to support and enhance resilience to climate change, and encourage strengthening of the relationship between sustainable development and adaptation under the Convention. Partner institution is Bangladesh Centre for Advanced Studies.

(e) *Linking sea level rise, coastal biodiversity and economic activity in Caribbean island states: a pilot study*

Amongst the regions that are most at risk from climate change and sea level rise are small islands states. This study will address how climate change will impact on the coastal biotas of small island states through sea level rise, coastal squeeze and extreme weather events, examining the potential impacts on the tourist and fishing industries that depend critically on biodiversity, together with the potential policy options for optimising and maintaining ecosystem services upon which the small island states depend. Partner organisation is CPACC—Caribbean Centre for Planning and Adaptation to Climate Change.

(f) *Capacity building with regard to development and use of integrated scenarios for vulnerability and adaptation studies in developing countries*

This three-year project is funded by the GEF Assessments of Impacts and Adaptation to Climate Change programme. The Tyndall Centre will work with project teams in twenty countries to provide training, advice and resources to allow them to undertake national/regional vulnerability and adaptation studies.

Department for Environment, Food and Rural Affairs

February 2002

Further supplementary memorandum submitted by the Department for International Development

NOTE ON DEFRA/DFID INITIATIVES RELATING TO REDUCTION OF CARBON DIOXIDE EMISSIONS IN DEVELOPING COUNTRIES

1. DFID/DEFRA have a number of initiatives ongoing that are related to reduction of carbon dioxide emissions in developing countries. These initiatives are grouped around four main work areas:

- Cross departmental coordination and working;
- Influencing the international agenda;
- Knowledge and research projects;
- Country projects.

A brief outline of each of the work areas is given below.

Cross Departmental Coordination and Working

2. A cross departmental working group related to energy efficiency and climate change, The Energy Efficiency and Developing Countries Working Group was set up in 1997. Since its launch, the group has expanded to include representatives from FCO and DTI. The main emphasis of the group is on taking a strategic approach to wide policy issues relating to climate change and developing countries.

Influencing the International Energy and Climate Change Agenda

3. DFID is engaged in the international climate change negotiations under the UNFCCC. We work closely with DEFRA, the UK lead department, to ensure that development issues are sufficiently integrated into UK and EU positions, thereby influencing UN decisions. DFID is also represented on the UNFCCC Least Developed Countries Expert Working Group, a sub committee of the UN framework that focuses on climate change and development policy issues. DFID is engaged with the developing international debate on the clean development mechanism and how this relates to mainstream development work. This will inform a coherent policy in due course.

Knowledge and Research Projects

4. DFID has a number of ongoing knowledge and research projects which address issues related to promoting clean energy use in developing countries. These include:

i. Encouraging CDM energy projects to aid poverty alleviation. Being carried our by University of Surrey, Centre for Environmental Strategy, the purpose is "To contribute to the design of the Clean Development Mechanism (CDM) so that poverty focused projects are encouraged to provide some capacity building in host countries (Ghana, Kenya and Tanzania) in order to implement these small scale projects under the CDM."

ii. Moving Towards Emissions Neutral Development. Being carried out by EcoSecurities, the purpose is "To work with small-medium developing country (Bangladesh, Colombia, Ghana and Sri Lanka) governments and key stakeholders in defining needs for CDM frameworks to optimise developmental benefits and to provide DFID and other Donors with guidance on how to assist this process."

iii. Development of Simplified procedures for CDM Small Scale projects—The project aims to develop a simplified system of "fast track" small scale projects that would provide organisations with incentives to carry out small scale CDM projects. The results will feed into EU discussions on the procedures for the CDM.

Country Projects

5. A number of projects are ongoing within country programme that are aimed at energy efficiency. Ongoing projects include:

- Andhra Pradesh Power Sector Restructuring Programme—Reform of the state electricity utility aimed at commercial viability and reduced losses.
- Orissa Rural Community Electricity Supplies Project —Reducing technical and commercial losses on rural electricity systems through establishing formal commercial arrangements for customers, including proper metering and billing. This is resulting in a substantial reduction in electricity wastage. DFID is in partnership with the private sector owner and operator of the utility.
- China – GEF Energy Efficiency Project—The Energy Conservation Project will support the introduction of a market-based approach to financing energy conservation investments, energy performing contracting, which has the potential to overcome some of the major impediments to energy conservation in China. Secondly, the project will support the introduction of a new energy information program, providing consumers with information on financially attractive energy conservation investments.
- Kyrgyzstan Tariff Policy Project State Property Fund—implementation of an energy policy tariff policy which ensures long term financial sustainability and takes account of the GoK's social, environmental and commercial objectives.
- Clean Energy Network: Reducing Fuel Poverty and Building Civil Society in Central and Eastern Europe and the newly independence States – the project aims to reduce fuel poverty and increase family energy use efficiency, thereby improving the lives of poor people.

Department for International Development

May 2002

TUESDAY 29 JANUARY 2002

Members present:

Tony Baldry, in the Chair

Mr John Battle
Ann Clwyd
Mr Piara S Khabra
Chris McCafferty
Mr Andrew Robathan
Mr Robert Walter
Tony Worthington

Memorandum submitted by Professor Martin Parry

CLIMATE CHANGE AND MILLIONS AT RISK

- The *attached documentation*[1] shows that hundreds of millions of people are expected to be additionally at risk as a consequence of climate change: due to water shortage, hunger, coastal flooding and disease.
- These risks to life and well-being are concentrated in developing countries, especially those in Africa and southern Asia. For example, of the 50 million people estimated to be newly at risk from hunger due to climate change by about 2050, *almost all these are expected to be in Africa.*
- Even a substantial reduction in greenhouse emissions does little to reduce such risks in the coming century. Reductions that are 10 times those envisaged by the current Kyoto targets might halve the number threatened, but *it would require an emissions cut double this (i.e. 20 times Kyoto) to bring risk levels down from hundreds to tens of millions.*
- Consequently, the conclusion is that *substantial impacts from climate change are inevitable*, especially in developing countries, and adaptation will be essential in order to avoid the most negative consequences. Mitigation alone will not avoid the problem.

CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

- Yet ongoing research suggests that the scale of such effects is very dependent on the future pathways of population growth and economic development. *A world with a more equitable distribution of wealth and lower population levels will experience much smaller levels of negative impact from climate change*, than a world where we assume "business-as-usual" (eg high population growth and low levels of development in Africa compared with other regions). In other words, how we shape the future world influences our future vulnerability to climate change.
- To illustrate, the estimated levels of *risk of hunger due to climate change under a sustainable world*[2] are less than a third those under a "business-as-usual" world. Almost all this reduction is due to different levels of population and wealth rather than different amounts of emissions and consequent climate change.
- This suggests that the most effective form of response to climate change is to devise *climate policies as part of an overall strategy for sustainable development* that, by both reducing poverty and increasing technological/managerial ability, reduce the exposure to hunger, flooding, water shortage and disease, and also increase the ability to adapt to such challenges.

Professor Martin Parry,
Jackson Environment Institute,
School of Environmental Sciences, University of East Anglia

January 2002

---

[1] *See* M Parry, N Arnell, T McMichael, R Nicholls, P Martens, S Kovats, M Livermore, C Rosenzweig, A Iglesias and G Fischer, Millions at Risk: Defining Critical Climate Change Threats and Targets, *Global Environmental Change* 11.3 (2001): 1–3. Also available at http://www.jei.uea.ac.uk/millions_at_risk.html.

[2] The sustainable world here is that defined by the IPCC as B2, and "business-as-usual" is A1FI (Intergovernmental Panel on Climate Change, *Climate Change 2001: Synthesis Report,* Geneva, 2002).

Further memorandum submitted by Professor Martin Parry

IMPACTS ON FOOD SUPPLY

- Reduced moisture combined with heat stress will probably *reduce world-wide the yield of major food staples (wheat, rice, maize) by 5 to 10 per cent* by 2050 under current best-estimate projections of climate change[3].
- The greatest reductions are expected to be in *Africa* (mainly the sub-humid parts, i.e. all but equatorial Africa), *the Middle East, and the Indian subcontinent.*
- The knock-on effect of this would be by 2050 to *reduce global food production by perhaps 5 to 10 per cent* from levels it otherwise would have been, and to increase food prices by more than 15 per cent[3].

EFFECTS ON RISK OF HUNGER

- Price increases will leave low income groups less able to afford sufficient food, and hunger is estimated to increase, probably *by about 50 million at risk of hunger by 2050* (above the number estimated to occur without climate change).
- The projected increase in hunger due to climate change is *almost entirely in Africa,* due to relatively high levels of vulnerability stemming from poverty and weak infrastructure.
- The poorest groups within the poorest countries are those most likely to be negatively affected, due to low levels of technology and being marginalised from sources of information and ability.

WHAT RESPONSES WOULD BE MOST EFFECTIVE?

- Mitigation through emissions reduction will delay and reduce but not avoid the problem (see accompanying memorandum on Millions at Risk[4]). *Impacts are almost certainly inevitable and adaptation will be essential.*
- Reducing poverty and empowering the more vulnerable would generally increase resilience to climate change. Without concerted action on this, the *difference in ability between groups and countries to adapt autonomously to climate will increase the current difference between rich and poor.* Poorer groups will be most adversely affected, while more wealthy ones less so.
- *Transfer of knowledge* from developed to developing countries, specifically about technologies designed to respond to climate change, would increase the latter's ability to adapt.
- Specific adaptive actions to increase resilience of agriculture to climate include: development of *drought-resistant crop varieties,* use of *more efficient forms of irrigation* (eg drip-feed rather than overhead), and *effective pricing of water.* Most technologies exist now; the issue is implementation rather than research.
- But there are also key research efforts needed, such as in plant breeding for climate change. A global effort is required to develop forms of agriculture better suited to a warmer world; one where droughts and floods may be more common. *Only the public sector will take the necessary long-term view.* Most agricultural research is now in the private sector, where climate change is seen as too long-term to deserve attention. The public- and foundation-funded CGIAR[5] should take a lead here. These activities should be supported by DFID.
- The policies of response to climate change most likely to succeed are those *which are integrated into a strategy for sustainable development* (see accompanying memorandum on Millions at Risk).

Professor Martin Parry,
Jackson Environment Institute,
School of Environmental Sciences, University of East Anglia

January 2002

---

[3] M Parry and M Livermore (ed) "A New assessment of the Global Effects of Climate Change", *Global Environmental Change,* Vol. 9 Special issue, 2000.; also reported in *IPCC Climate Change 2001: Synthesis Report,* Geneva 2002.

[4] Ev 39.

[5] Consultative Group on International Agricultural Research.

Memorandum submitted by Professor Nigel Arnell, Department of Geography, University of Southampton

THE POTENTIAL IMPACTS OF CLIMATE CHANGE ON WATER RESOURCES IN THE DEVELOPING WORLD

- Climate change poses a threat to water resources and their management in developing countries. An important component of this threat is the uncertainty over the magnitude of climate change impacts at a location.
- The effects of climate change on river flows and recharge in developing countries are largely dependent on changes in rainfall amount and timing.
- Changes in the variability of rainfall from year to year—and changes in patterns such as El Niño—may have as important an effect on water resources as changes in mean climate.
- Under most climate change scenarios, southern and western Africa and the Middle East are projected to see reduced river flows and recharge in the future. Possible changes in south Asia are less clear: some scenarios suggest reduced runoff (greater drought risk) whilst others show increased runoff (greater flood risk).
- Climate change is likely to have a substantial effect on people living in areas that are currently water-stressed, most of which are in developing countries.
- Different aspects of water resources will be affected by climate change in different ways. Whilst access to safe water will probably be influenced by climate change, especially in rural areas, access to sanitation is likely to be relatively unaffected.
- The actual impacts of climate change will depend not only on the change in climate, but also on changes in how water resources are managed. The adoption of flexible management approaches and policies which can cope with current climatic variability (such as increased access to safe water) will reduce vulnerability to climate change.
- Water resources are also influenced by many other pressures, such as population growth, economic development and land use change, which will affect exposure to climate change.
- One practical implication is that all water resources development proposals should consider the effects of climate change on the ability of the proposed scheme to deliver its objectives, and whether the proposed scheme will affect the vulnerability of others to climate change.

1. INTRODUCTION: CLIMATE CHANGE AND WATER RESOURCES

1.1 It is a cliché that human society relies upon adequate water resources. Rivers and groundwater provide drinking water, water for agriculture in general and irrigation in particular, and water for industry and for cooling. River flows generate hydropower and enable navigation, and provide a means for the disposal of waste. Many economically-important ecosystems, such as wetlands, are dependent on inflows of water from upstream. Floods bring damage and disruption and threaten lives, and rivers and water bodies can harbour water-borne disease. The sustainable development of societies in developing countries relies on the sustainable management of water resources in general.

1.2 However, in the mid 1990s approximately a third of the world's population lived in countries deemed by the United Nations to be water stressed, 20 per cent lacked access to safe drinking water and about 50 per cent lacked adequate sanitation[6]. Pressures on water resources over the next few decades will be strongly influenced by economic developments, attitudes towards resource use and population growth—and climate change will add to these pressures. In some areas climate change may improve the water resources position, but in others it is likely to make matters considerably worse.

1.3 This memorandum summarises the potential impacts of climate change on water resources in developing countries. The information is largely taken from the Third Assessment Report of the Intergovernmental Panel on Climate Change[7] and climate change impacts research funded by the UK Department of the Environment, Food and Rural Affairs (DEFRA)[8].

---

[6] UNEP (1999) *Global Environment Outlook 2000*. Earthscan: London.

[7] Arnell, N W & Liu, C (2001) Hydrology and water resources. in: J McCarthy *et al.* (Editors), *Climate Change 2001: Impacts, Adaptations and Vulnerability*. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, Cambridge. pp 191–233.

[8] Arnell, N W (1999) Climate change and global water resources. *Global Environmental Change* 9, S31-S49. and Arnell, N W *et al.* (2002) The consequences of CO_2 stabilisation for the impacts of climate change. *Climatic Change. in press.*

2. EFFECTS OF CLIMATE CHANGE ON RIVERS AND GROUNDWATER

2.1 Climate change has three potential effects on river flows and groundwater recharge. First, it may affect the volume of flow or recharge at a particular time of year. Second, it may affect the timing of flows or recharge, either through the year or from year to year. Third, it may affect the quality of river flows or groundwater through changes in the volume and timing of water, and through changes in water temperature.

2.2 Although climate change will generally result in increased evaporation, largely due to increased temperature, changes in the volume and timing of river flow and recharge are primarily dependent on changes in the amount and timing of rainfall. A map of changes in river flows due to climate change therefore closely follows the map of changes in rainfall (see attached figure), although the percentage changes are generally greater and if the increase in rainfall over a catchment is less than the increase in evaporation, river flows decrease despite the increase in rainfall. The actual effect of a change in climate on river flows and recharge in a catchment depends on the current climate of the catchment and its geology. For example:

- a given percentage change in rainfall produces a greater percentage change in river flow or recharge, the more arid the climate: river flows and recharge in dry areas are more sensitive to climate change than river flows in wetter areas;
- changes in river flows in a catchment with large amounts of storage—in lakes, wetlands or groundwater, for example—will be determined by changes in the cumulative rainfall over a season, whilst changes in river flows in more responsive catchments will be determined by changes in the intensity of storm rainfall.

2.3 The timing of river flows through the year in areas receiving snowfall—such as regions receiving water from the Himalaya—reflects the melting of snow in spring. In general, higher temperatures mean that more precipitation during winter falls as rain rather than snow, and runs off quickly to the river. Winter flows are therefore increased, and spring snowmelt flows are reduced. Rivers feeding a small number of communities in the developing world are fed from glaciers: higher temperatures will result in increased glacier melt, and therefore higher flows in the short term, but may result in the glacier disappearing.

2.4 The sensitivity of river flows and recharge to changes in rainfall means that quantitative estimates of the actual effects of climate change in a catchment are uncertain, because climate model projections of changes in rainfall are uncertain. At the regional scale, however, there are some consistencies. Most scenarios result in a decrease in river flows in southern Africa, much of west Africa, the Middle East and parts of South America. Most scenarios result in an increase in river flows in east Africa and south east Asia. There are conflicting projections for south Asia and central Africa.

2.5 Changes in flood and drought frequency are dependent not only on changes in mean climate, but also on how variability in climate from year to year will change. This is currently not well known, and the indications so far are that changes in flood and drought flows are similar in direction—but greater in relative magnitude—to changes in average flows. It is possible that a particular location could see both an increase in floods and an increase in droughts, if the seasonal pattern of rainfall is significantly exaggerated. Changes in the pattern of variability in climate from year to year—such as an altered El Niño—are likely to have particular effects in tropical and sub-tropical regions.

2.6 There have been very few detailed studies of the potential effects of climate change on river flows and groundwater recharge in dry or tropical regions generally, and developing countries in particular. It is possible that changes in climate may result in "surprising" changes in hydrological processes and therefore river flows and groundwater recharge in some catchments.

3. WHAT ARE THE POTENTIAL IMPACTS ON WATER RESOURCES?

3.1 Changes in river flows and groundwater recharge will affect the availability of water resources and the water-related hazards of floods and ill-health, but so too will population change, economic development and alterations in the way in which water resources and hazards are managed.

3.2 A crude, but widely used, indicator of water resources pressure is the ratio of water withdrawals to the amount of available water: if a country is using more than 20 per cent of its available runoff and recharge, then it is likely to be suffering water-related limitations on development. The table below summarises the number of people living in countries withdrawing more than 20 per cent of their resources in the absence of climate change, together with the numbers of people who would experience a reduction in water availability due to climate change and hence an increase in water resources stress. Most of these people live in south Asia, central Asia and southern Africa. The table shows that resource pressures are likely to increase for very large numbers of people, and also that the effects of climate change are likely to be reduced substantially only by aiming for a low CO_2 stabilisation target.

Global population at risk of increased water scarcity

	Population in countries using more than 20 per cent of their resources, with no climate change (millions)	*Population with an increase in stress (millions)*		
		Unmitigated emissions	*Stabilisation at 750ppmv*	*Stabilisation at 550ppmv*
1990	1,710			
2025	5,022	338–623	242	175
2050	5,914	2,209–3,195	2,108	1,705
2085	6,405	2,831–3,436	2,925	762

Source: Arnell et al. (2002) *Climatic Change in press*

Note that other climate change scenarios could give different quantitative results

3.3 Such global and regional figures provide only one indication of the potential implications of climate change for water resources. In practice, different aspects of water resources in developing countries are likely to be differently affected by climate change. The attached table summarises the implications of climate change for water resources in developing countries: there are unfortunately very few published quantitative case studies which have looked at these impacts. Many of the users of water resources will be more affected by changes in variability over time and extreme conditions than by change in mean climate.

3.4 It is likely that the impacts of climate change on water resources will be greatest on the poorest parts of the community, who may be least able to recover from flood damage or obtain access to scarcer water resources. There has, however, been no empirical research on this issue.

3.5 Whilst climate change has the potential to adversely affect water resources, it is likely that in some cases it may lessen some water resources pressures. For example, an increased frequency of flooding in desert wadis would increase flood risk, but could also increase the recharge of local floodplain aquifers.

3.6 The actual impacts of climate change on water resources in a particular location will depend not just on the change in climate, but also on the procedures used to manage those water resources. In general, unmanaged resources—such as many rural water supplies—are more exposed to climate change than managed resources, because these in principle have some means of intervention. A corollary of this is that as management procedures and infrastructure change, then vulnerability to climate change alters. As a general rule, measures which are taken to lessen exposure to current water-related problems will also reduce the potential impacts of climate change.

3.7 An increasing scarcity of water in some regions has the potential to increase conflict between different users of water within an area and between upstream and downstream users. The extent to which such conflict develops will depend on other pressures within the region, although it is likely that resource pressures may become more frequent.

3.8 The primary uncertainties in the potential impacts of climate change on water resources in developing countries are:

- uncertainty in the potential change in climate, and hence river flows and groundwater recharge;
- uncertainty in the future development of water management policies and practices, which will affect exposure to climate change; and
- uncertainty in the evolution of other pressures on water resources, including population growth, economic development and land cover change (which also affects river flows and recharge).

4. IMPLICATIONS

4.1 The main implications of climate change for water resources are firstly that there is an additional pressure on water resources in many developing countries, and secondly that the conventional assumption, widely used in project planning and assessment, that the past is a good guide to the future is no longer tenable.

4.2 One practical implication is that all water resources development proposals and strategies should explicitly consider the effects of climate change on the ability of the proposed plan to deliver its objectives, and whether the proposed scheme will affect the vulnerability of others to climate change.

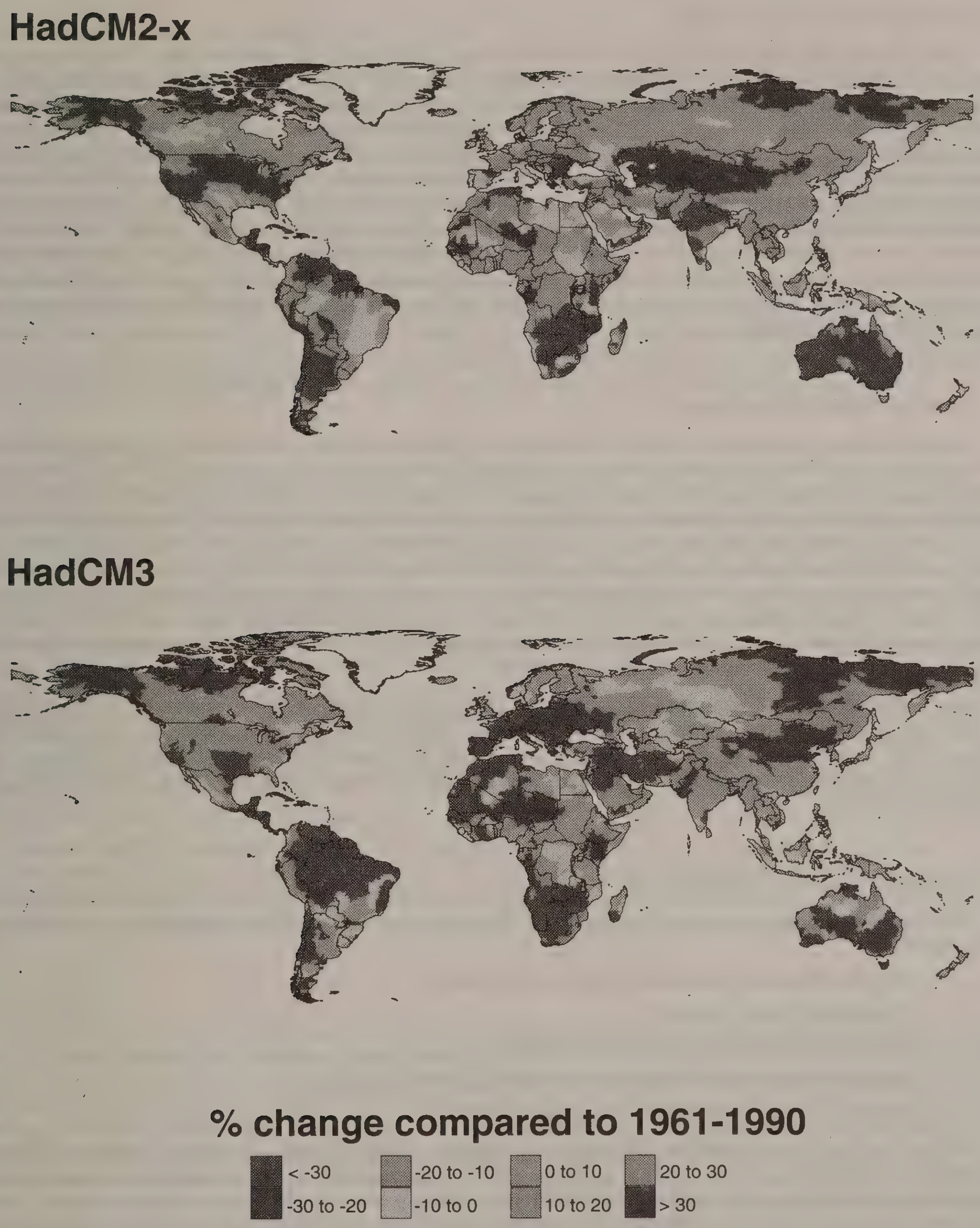
4.3 The effects of climate change on water resources are uncertain, and it is this uncertainty, rather than climate change *per se,* that poses the greatest challenge to scheme design and assessment. This uncertainty suggests that flexible schemes are to be prefered over fixed long-term schemes that are difficult to upgrade to reflect altered circumstances.

Water resources in developing countries: impacts of climate change

Aspect of water resources	*Description*	*Implications of climate change*
Municipal water supply	Generally derived either directly from large rivers or from reservoirs	Source reliability depends on changing frequency or duration of low flows in the catchment supplying the source. Increased high flows could lead to increased sedimentation of reservoirs. Changes in the price of urban water due to increased scarcity will affect the poorest most significantly
Rural water supply	Generally derived from local streams or groundwater	Availability of source will depend on changes in local rainfall
Irrigation supply	Large-scale from reservoirs, small scale from local streams or groundwater. Higher temperatures will increase demand	As above, but coupled with possible effects of increased demands
Access to safe water	see municipal/rural water supply	As above *Quality* of available water largely determined by non-climatic factors around source
Effluent disposal	Into small water courses or large rivers	Dilution and assimilation capacity influenced by the amount of water in the receiving waters, as well as water temperature (higher temperatures generally lead to degradation of water quality)
Access to sanitation	Related to effluent disposal	Unlikely to be affected by climate change
Hydropower generation	Generally from large schemes supported by reservoirs or lakes	Change in performance dependent on changes in the timing of inflows to reservoirs and lakes and the frequency and duration of droughts
Riverine and lake navigation	Commercial activities focused on large rivers and lakes	River navigation affected by frequency and duration of high and low flows; lake navigation influenced by lake levels which affect port facilities
Water-borne disease	Largely, but not exclusively, associated with standing water bodies, which may be local	Changes in local rainfall will influence occurrence of standing water bodies
Flood management	Distinction between flooding on major rivers and localised flash flooding	Flooding on major rivers affected by changes in long-duration rainfall upstream; flash flood frequency affected by changes in local storm rainfall frequency
Environmental conservation	Wetlands are dependent on river flows and/or recharge, and provide valuable services	Changes in wetlands dependent on changes in incoming river flows or local recharge

Professor Nigel Arnell, Department of Geography and Tyndall Centre for Climate Change Research, University of Southampton

January 2002



Average annual runoff by the 2050s

Memorandum submitted by Professor Robert Nicholls, Flood Hazard Research Centre, Middlesex University

Climate Change and Coastal Zones

1. *The importance of coastal zones*

Low-lying coastal zones are sensitive to climate change, most particular sea-level rise. This is important when considering sustainable development as coastal zones are among the world's most diverse and productive environments and they also provide home to much of the world's population. In 1990, 1.2 billion people (or 23 per cent of the world's population) lived within 100 km and 100 m of a coastline. These "coastal" populations are growing rapidly due to migration to the coast and urbanisation: large increases in coastal population are expected, particularly in south, south-east and east Asia and around much of Africa. Coastal areas are already threatened directly or indirectly by a range of coastal hazards such as erosion, saline intrusion, flooding/storms and tsunamis. Human activity is also producing profound changes to the world's coastal zone such as reducing freshwater inputs, modifying sediment budgets, armouring the coast and direct and indirect ecosystem destruction. Therefore, climate change and sea-level rise are an *additional* pressure on coastal areas, which will interact adversely with many of these other trends, and will potentially hinder the goal of sustainable development.

2. *Climate change in coastal areas*

Global warming is expected to lead to an increase in global mean sea-level rise due to thermal expansion of warming surface waters and the melting of small land-based glaciers such as those in the Alps. During the 21st Century, Greenland and Antarctica are expected to make little net contribution to sea level. The IPCC Third Assessment Report estimated that global-mean sea levels had risen 10 to 20 cm during the 20th Century and will rise between nine and 88 cm (the mid estimate is 48 cm) from 1990 to 2100[9]. Thus, there is likely to be a significant acceleration of global-mean sea-level rise during the 21st Century. At the regional and local scale, future changes in sea level are more uncertain due to regional climate change effects on sea level and geological processes influencing land uplift/subsidence. As an example, deltaic areas are always prone to subsidence, so higher rates of sea-level rise might be expected in these areas. This has important implications for the densely-populated deltas of Asia.

Many other climate factors will change in coastal areas such as rising seawater temperature. Of particular interest are possible changes in the track, frequency and intensity of storm events. For instance, it has been argued that in a warmer world more intense hurricanes are possible than occur today. However, the uncertainties remain too large to be confident of the direction of change, if any, and this is an important area for future research.

3. *The impacts of climate change and sea-level rise*

With global warming and sea-level rise, the IPCC Third Assessment[10] concluded that many coastal systems will experience:

- Increased levels of inundation and storm flooding;
- Accelerated coastal erosion;
- Seawater intrusion into fresh groundwater;
- Encroachment of tidal waters into estuaries and river systems;
- Elevated sea-surface and ground temperatures.

Without appropriate adaptation, these physical changes will lead to socio-economic impacts on human populations and their activities, such as increasing flood losses and destruction of beachfront investments. Most assessments to date have only considered the potential impacts of sea-level rise on today's world. These studies all suggest that impact potential in many developing countries is large and increasing rapidly. Other studies point to a global tendency for shoreline retreat on sandy shorelines, and the observed sea-level rise during the 20th Century may be a causal factor, although is still widely debated.

Natural ecosystems such as saltmarshes, mangroves and coral reefs are already widely degraded by human activities. Given sea-level rise, saltmarshes and mangroves may be further degraded or lost. Coral reefs appear more threatened by rising sea temperature, which could cause death of the reef in tropical areas where corals are near the upper limit of their thermal tolerance. In the longer term, rising CO_2 levels could cause chemical changes which would reduce the capacity of the reef to build upwards with sea-level rise. In all cases, this will reduce the range of services (eg, storm protection, fisheries, etc) that these ecosystems provide to coastal communities.

---

[9] Houghton, J T, Ding, Y, Griggs, D J, Noguer, M, van der Linden, P J and Xiaosu, D (eds), 2001. *Climate Change 2001. The Scientific Basis.* Cambridge University Press, Cambrid.

[10] McCarthy, J J, Canziani, O F, Leary, N A, Dokken, D J, & White, K S (eds), 2001. *Climate Change 2001: Impacts, Adaptation and Vulnerability*, Cambridge University Press, Cambrid.

4. *Examples: Flood and Wetland Impacts*

The impacts of sea-level rise on the incidence of coastal flooding and coastal wetlands (excluding coral reefs) have been modelled on a regional and global basis[11, 12]. In 1990, it is estimated that 10 million people/year experienced flooding due to storm surge globally—nearly all these people live in the developing world. Under a scenario of a 40-cm rise in global sea level, business-as-usual socio-economic changes, and no specific adaptation for sea-level rise, this increases to about 90 million people/year or more by the 2080s. Many of these people will experience flooding every year, suggesting severe impacts and possible displacement of these impacted populations. These results show that a relatively small global rise in sea level (about 40-cm) could have significant adverse impacts on coastal populations, if there is no adaptive response.

By the 2080s, a 40-cm rise in global-mean sea level could cause the loss of up to 22 per cent of the world's coastal wetlands. Based on projecting existing trends, direct and indirect destruction by humans could cause greater losses. In this situation, sea-level rise would reinforce other adverse trends of wetland loss. The largest losses due to sea-level rise will be where the tidal range is lowest such as around the Mediterranean and Baltic, the Atlantic coast of Central and North America and most small islands, including the Caribbean.

5. *Vulnerable Regions*

All coastal areas are vulnerable to these changes to varying degrees. However, the impacts are likely to be felt disproportionately in certain areas reflecting both natural and socio-economic factors that lead to higher vulnerability. In absolute terms, the affected people identified in the flood analysis discussed in 4) are found around Africa, and most particularly, South and South-East Asia, with lesser impacts in East Asia. The vulnerability of Africa reflects rapid population growth, combined with a limited capacity to implement flood management due to economic constraints. The vulnerability in Asia reflects significant population growth within the numerous large deltas, where implementing flood management is much more expensive than in most other coastal settings. The vulnerability of small islands, particularly low-lying coral atolls such as found in the Maldives has been recognised for some time. The flood analysis suggests that the islands of the Caribbean, the Indian Ocean and the Pacific Ocean may experience the largest relative increase in flood risk. This vulnerability reflects the concentration of population around the coast, even on the "high" islands. While they have not been examined in detail, other impacts such as degradation of coral reefs would seem to make these areas especially vulnerable to climate change. Further, adaptation options in many small islands are more limited than other coastal regions.

National studies also identify hotspots of vulnerability. For instance, Guyana and Suriname have a high impact potential and have similar problems to many of the Asian deltas. This contrasts with a lower vulnerability in most of South America. There is a need for a systematic identification of similar hotspots at a detailed level around the world to focus more detailed work on impacts and adaptation.

6. *Responses*

Responding to climate change and sea-level rise requires identifying the most appropriate mixture of mitigation and adaptation. Mitigation could greatly reduce the risks associated with sea-level rise and climate change, particularly in the long-term. However, some climate change appears inevitable, so we must also be prepared to adapt to these impacts[13, 14]. Adaptation acts to reduce the impacts of sea-level rise and climate change, as well as other changes (as well as exploiting benefits). Given the large and growing concentration of people and activity in the coastal zone, autonomous (*ie*, spontaneous individual and market-driven) adaptation processes are unlikely to be sufficient to respond to sea-level rise. Further, adaptation in the coastal context is almost universally seen as a public responsibility. Therefore, all levels of government have a key role in developing and facilitating appropriate adaptation measures. There are three generic planned adaptation options for sea-level rise and climate change:

---

[11] Climate change and its impacts. Some highlights from the ongoing UK research programme: a first look at results from the Hadley Centre's new climate model. 1998. Department of the Environment, Transport and the Regions, London and the Met Office, Bracknell.

[12] Nicholls, R J, Hoozemans, F M J, & Marchand, M 1999. Increasing flood risk and wetland losses due to global sea-level rise: Regional and global analyses. *Global Environmental Change*, 9, S69-S.

[13] Parry, M, Arnell, N, Mcmichael, T, Nicholls, R, Martens, P, Kovats, S, Livermore, M, Rosenzweig, C, Iglesias, A & Fischer, G, 2001. Millions at Risk: Defining Critical Climate Threats and Targets. *Global Environmental Change* and also avalable at http://www.jei.uea.ac.uk/millions_at_risk.html.

[14] Arnell, N W, Cannell, M G R, Hulme, M, Kovats, R S, Mitchell, J F B, Nicholls, R J Parry, M L, Livermore, M T J & White, A 2002. The consequences of CO_2 stabilisation for the impacts of climate change *Climatic Change, in press.*

- *(Planned) Retreat*—all natural system effects are allowed to occur and human impacts are minimised by pulling back from the coast;
- *Accommodation*—all natural system effects are allowed to occur and human impacts are minimised by adjusting human use of the coastal zone;
- *Protection*—natural system effects are controlled by soft or hard engineering, reducing human impacts in the zone that would be impacted without protection.

However, adaptation needs to be seen as a process rather than just these technical measures. A particular issue of interest is resolving conflicts between sustaining the human use and ecosystem functioning of the coastal zone under climate change and sea-level rise. There is a need to start strategic planning of appropriate responses now, particularly enhancing the technical and institutional capacity of coastal management, which is under-developed in much of the world, including the most vulnerable regions identified here. Given the wide range of existing coastal problems, such planning and capacity building could have immediate benefits.

7. *Conclusions*

The main conclusions are as follows:

- Climate change in coastal areas will lead to global-mean sea-level rise, rising seawater temperatures and possible changes in the track, frequency and intensity of storms, among other changes. This is an additional stress on coastal zones, which could hinder the goal of sustainable development.
- Most impact assessments have focussed on the impacts of sea-level rise and no other climate change. They identify a high and increasing impact potential in many developing countries.
- The most vulnerable regions appear to be Africa and parts of Asia, reflecting high and growing exposure and the low economic base to support adaptation. However, in relative terms, small islands, including the Caribbean, appear most vulnerable, and they have some of the most limited adaptation options.
- Coastal ecosystems are also threatened by climate change, although this requires more quantification, particularly for coral reefs.
- A more detailed global analysis of the different types of vulnerability is essential to focus work on impacts and adaptation.
- An appropriate mixture of mitigation and adaptation would be the best response to climate change. There are a range of effective adaptation options, although they need to be considered within the broad process of coastal management. Therefore, enhancing the capacity for coastal management is a fundamental step in adaptation to climate change and sea-level rise.

Based on this, DFID could help to promote sustainable development of coastal areas by:

- Encouraging efforts to improve our understanding of vulnerability;
- Promoting more evaluation of the implications of climate change in coastal areas, particularly in the vulnerable regions identified above;
- Enhancing coastal management capacity so that it can deal with the full range of issues, including climate change.

Professor Robert Nicholls, Professor in Coastal Geomorphology and Management,
Flood Hazard Research Centre,
Middlesex University

January 2002

Memorandum submitted by the London School of Hygiene and Tropical Medicine

CLIMATE CHANGE AND HUMAN HEALTH

1. *The potential impacts of climate change on human health*

Global climate change will probably have a wide range of health impacts as many diseases are sensitive to climate. The IPCC Third Assessment Report[15] currently identifies the following main mechanisms by which climate change will affect human health.

- Changes in distribution and seasonal transmission of malaria and other diseases that are transmitted by insects and ticks (eg dengue, mosquito-borne viruses, leishmaniasis). Vector-borne diseases are one of the major contributors to the global burden of disease (according to the WHO) and are highly sensitive to climate conditions.

---

[15] *Climate change 2001: Impacts, Adaptation, and Vulnerability*. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Eds McCarthy *et al.* CUP, New York.

- Changes in food supply due to reduced crop yields in vulnerable areas.
- Changes in frequency and or intensity of weather disasters, particularly floods (coastal and riverine) and droughts.
- Increases in food and/or water borne diseases, particularly diarrhoeal diseases, as higher temperatures encourage the growth of micro-organisms and more erratic rainfall increases the frequency of contamination of surface water.
- Population displacement and economic disruption associated with climate change and sea level rise.
- The direct effects of higher temperatures in urban populations, causing increased cardio- respiratory mortality in relation to heatwaves. In temperate cities, increases in heat related deaths may be more than offset by decreases in cold-related deaths but in tropical cities the net effect is likely to be adverse.

The IPCC concluded that the negative impacts on health will be greater than the benefits to health of climate change and that the worst impacts will be in developing countries.

The World Health Organisation has included climate change as one of the six environmental risk factors in the forthcoming Global Burden of Disease assessment. Climate change research has focused on the physical, chemical and biological impacts, and impacts within economic sectors such as agriculture and water resource management. Health research has been directed towards better understanding of direct temperature effects on health, of the seasonality of certain infectious diseases, and of the public health consequences of extreme weather events. Predictive models have been developed that link climate scenarios with vector-borne disease distributions. Policy-makers should appreciate that, while our scientific capacity to model various health outcomes of climate change continues to evolve, it is not possible to make precise and localised projections for many health outcomes, especially for those that result indirectly from a sequence of impacts.

Reduced food and water supplies. Climate change represents an additional pressure on the world food supply system. The current IPCC assessment is that yields of cereal grains would increase at high and mid-latitudes, but decrease at lower latitudes. The world's food system may be able to accommodate such regional variations at the global level. However, at the local level, some populations may be severely affected. The UN Food and Agriculture Organization (FAO, 1999) estimates that 790 million people in developing countries do not have enough to eat. Environmental factors, both natural and those that are a consequence of human activities, can limit agricultural potential. Adaptation should be undertaken, via development of crop breeding and management programmes for heat and drought conditions. In the near term, adaptation strategies will improve productivity in marginal environments.

Diarrhoea is one of the most important causes of death and morbidity, particularly of children, in developing countries. Recent studies have demonstrated it is highly sensitive to relatively small increases in temperature: for example, research in Peru[16] showed that each 1°C increase in daily temperature resulted in an 8 per cent increase in paediatric admissions for diarrhoea. This suggests that predicted temperature increases over the coming century are likely to significantly increase the impact of diarrhoeal disease in the poorest populations (currently estimated by the WHO as 6.5 per cent of the total burden of disease in Africa and over 8 per cent in the poorest countries of SE Asia). The projected increase in precipitation variability may also increase diarrhoea morbidity by the contamination of water supplies.

Health consequences of floods and droughts. Any increases in climate extremes (storms, floods, cyclones, etc) associated with climate change would cause physical damage, population displacement, and adverse effects upon food production, freshwater availability and quality, and upon the risks of infectious disease epidemics, particularly in developing countries. Over recent years a number of major climate-related disasters have occurred which have had major adverse effects on human health—including floods in China, Mozambique, and Bangladesh, famine in Sudan, and Hurricane Mitch which devastated Central America. Whilst these events cannot be confidently attributed to climate change, they indicate how vulnerable populations are susceptible to extreme weather. There is evidence that exposure to natural disasters may have long term impacts on mental health in adults and children.

Malaria and other vector borne diseases. Malaria and other vector borne diseases are likely to increase their range in a warmer climate. This is already happening, but the relative importance of climate change, local changes in environment and population behaviour, and collapse of public health control measures, is unclear in most situations[17]. Changes in rainfall distribution throughout the year and its intensity are more important (and less predictable) for malaria transmission than temperature increases. There is good evidence that El Niño affects epidemic risk in certain regions[18]. The important extensions of actual malaria occurrence due to climate change, as distinct from the potential for malaria to be transmitted, are likely to be in those tropical countries with high altitude areas where the population of the hills are free from malaria but are surrounded by plains in which malaria is highly endemic. Here, the spread of both the vector and the malaria parasites can easily follow changes in climatic suitability. So far, extensions laterally into higher latitudes have been more due, at any rate in Asia, to failures of public health measures than climatic changes. Public health measures, well applied, should be able to control epidemics and unstable malaria at the edges of its distribution. Climate change is unlikely to have a large effect on the severity or transmission of malaria in those countries of tropical Africa where there is already massive transmission and suffering from the disease.

---

[16] Checkley *et al.* (2000) *Lancet*, 355, 442–4.

[17] Kovats *et al.* (2001) *Phil Trans Roy Soc B*, 356: 1057–10.

[18] Kovats (2000) *WHO Bulletin*, 78: 1127–1135.

Arboviruses (insect-borne virus diseases) provide a less predictable and perhaps more disturbing threat than does malaria in relation to global climate change. Climate change may facilitate their spread to the more temperate developing countries and it is less predictable which will emerge as major problems. Several arboviruses can give rise to fatal illness (for example, yellow fever, dengue haemorrhagic fever) for which treatment is not feasible and few have vaccines available.

3. *Which populations are the most vulnerable?*

There are many uncertainties in assessing the potential health impacts as climate change scenarios are highly uncertain at the spatial and temporal resolution most appropriate for health impact assessment. The largest source of uncertainty is the future world in which the climate impacts are felt—will it be more or less equitable with better or worse health care? Therefore, research activities have shifted towards identifying those populations most vulnerable to the health impacts of climate change. For example:

- Populations in currently malaria-free areas in the East African Highlands are vulnerable to increases in malaria associated with climate change.
- Populations in Bangladesh are vulnerable to health impacts of flooding associated with climate change.
- Populations in central America are vulnerable to increases in flood and landslide risk, and also drought risk, due to any increase in rainfall variability, including possible more frequent and intense El Niño events.

4. *Clean energy and the health benefits of mitigation policies*

Actions taken to reduce greenhouse gas emissions are very likely to benefit health. Fossil fuel combustion releases both local hazardous air pollutants (particulates, ozone, nitrogen oxides and sulphur dioxide) and greenhouse gases. Hence, policies to reduce greenhouse gas emissions via a reduction in vehicle exhausts or via an increase in the efficiency of indoor household cookstoves (particularly in low income countries) would yield substantial benefits to health. Controlling road traffic would also benefit health through reductions in road traffic accidents, a leading cause of death world-wide. The benefits to health from mitigation are highly dependent on the technologies and sectors that are involved. For example, a significant number of premature deaths could be prevented via reductions in particulate emissions in the household sector in China (ie domestic fuel use). Large numbers of people lack access to clean energy and suffer ill health and social disadvantage as a result. Renewable energy sources, particularly solar and wind, could help provide this much needed energy while minimising greenhouse gas emissions and maximising health gain. However, rigorous health impact assessment of renewable energy technologies should be undertaken in developing countries.

5. *Adaptation measures to reduce the potential health impacts of global climate change*

Adaptation measures can be used effectively to reduce greatly many of the potential health impacts of climate change. The most important, cost-effective and urgently needed measure is to rebuild public health infrastructure. Many diseases and public health problems that may otherwise be exacerbated by climate change could be substantially prevented with adequate financial and human public health resources. These resources would encompass public health training programs, research to develop and implement more effective surveillance and emergency response systems, and sustainable prevention and control programs. Low income countries already have spending well below that required to control infectious disease. According to the *WHO Commission on Macroeconomics and Health* the minimum level of health expenditure to introduce and maintain essential health interventions is US$34 per person in low income countries and US$38 per person in the least developed countries. Poor countries currently lack the needed financial resources to meet the most basic health needs of their populations.

Current debate on adaptation specifically to reduce the health impacts of climate change has focused on the following areas:

- Improved use of climate information to forecast and control epidemics of malaria and other infectious diseases.
- Improved surveillance of diseases and disease vectors in order to detect any changes in distribution, seasonality or transmission intensity, or the emergence of new diseases.
- Disaster preparedness.

— Heat wave early warning systems.

Epidemic forecasts begin with a crude prediction of epidemic risk several months in advance, derived from the long-range weather forecast. This forecast may be made more precise several weeks in advance using vegetation and other patterns on satellite images, allowing preventive and early response resources to be put in place. Research is being undertaken in East Africa to see how far this can be made an operational tool and there are also similar plans within India. These activities merit support since, once set up, the ongoing costs in terms of weather forecasting and satellite imagery are low. *The key issue is linking information to response.* The poorest populations are least able to remain in a state of perpetual readiness to cope with epidemics. Epidemic forecasting has the potential to really alleviate the hazards to which poorer populations are exposed.

Capacity building for developing countries. Current efforts to support capacity building have focused on national *Climate Change Vulnerability and Adaptation Assessments.* However, health impacts have not been adequately addressed in most assessments, if at all, and the involvement of the health sector has been minimal. WHO is developing guidelines for developing countries to undertake health impact assessments for climate change that address health sector participation and capacity building. These activities could be supported by DFID.

London School of Hygiene and Tropical Medicine

January 2002

Examination of Witnesses

Professor Martin Parry, Jackson Environment Institute, School of Environment Sciences, University of East Anglia, Professor Nigel Arnell, Department of Geography and Tyndall Centre for Climate Change Research, University of Southampton, Professor Robert Nicholls, Professor in Coastal Geomorphology and Management, Flood Hazard Research Centre, Middlesex University, Professor Andy Haines, Dean, London School of Hygiene and Tropical Medicine, and Ms Sari Kovats, Research Fellow, London School of Hygiene and Tropical Medicine, examined.

Chairman

40. Good morning. Thank you all very much for having agreed to come and give evidence today. Just for the record, I know that you collectively have looked at the global impact of climate change on food, water, coastal flooding and health (particularly the incidence and prevalence of malaria); and this work has been used to build data on estimated impacts and to calculate the numbers of people at risk. The main projects, called the global fast track studies, have been funded by DEFRA over the past five years to show the implications of the Hadley Centre modelling. The reports have been widely circulated and influential in the Intergovernmental Panel on Climate Change and meetings of the Conference of Parties to the climate convention. I think you have all been involved in writing the IPCC Working Group II report in 2001 on impacts, adaptation and vulnerability, so we are very grateful to you for coming and giving evidence today. We are going to try and do something which is very difficult for us in Parliament which is to listen! What I am going to do is, I have two lots of questions I am going to put to you, and perhaps you can use that as a peg between you to address us, and we have got until quarter past eleven. At the end of these sessions of lots of questions perhaps we could then ask you a question you might like to start putting your minds to now, which is: are there ways, as a consequence of all this, where you feel DFID's policies should change? Are there areas of Government policy which should be different from that which they are at the present moment? The first group of questions we would like you to talk to us about are: what are the main impacts of climate change at a global level, with particular regard to developing countries; how easy is it to identify the impacts that are specifically due to the human-induced global warming that we have already experienced against a background of natural climate variability and ongoing social change; and, in relation to that, how reliable can any assessment of future impacts be; how confident are you in projected impacts for specific communities over the next 20 years, ie the planning horizon for sustainable development; and, lastly, to what extent is vulnerability about a lack of proper governance, structures and institutions to mitigate the impacts of climate change, and to what extent is it about a physical change that cannot be mitigated? Perhaps you could collectively and individually address us on those issues. Professor Parry, how you divide it up between you is for you, and we will listen.

(*Professor Parry*) As you rightly said, Chairman, we have been working as a group in different fields. Professor Arnell has been working on water; Professor Nicholls on coastal flooding and sea level rise; and Professor Haines and Ms Kovats on health, particularly malaria. I can perhaps say one or two things generally about how we brought our work together in terms of millions of people at risk. In each of these fields we have been able to estimate, in this instance only for the UK's Hadley model projections for climate change, the additional millions of people that might be at risk specifically from climate change over and above those that are at risk now, and are projected by the United Nations to be at risk in the future. Broadly speaking, without going into details here, our estimate is that of hundreds of millions of people likely to be additionally at risk either of hunger, water shortage, coastal flooding or malaria. Secondly, as we look at the particular geographic

[**Chairman** *Cont*]

distribution of these additional millions at risk in not all cases, but in most, a very great concentration of those additions are in Africa, the Middle East and Southern Asia. Specifically for the field of hunger that I work in, almost all the global total of 50 million people we expect additionally to be at risk from climate change occurs in Africa. That is partly for reasons of the nature of climate change in already largely arid areas, particularly sub-humid Africa, and also because of essentially the high vulnerability of that region. We can go into that later. That is a general statement about millions at risk that comes from all our work. I have mentioned in one phrase those at risk specifically due to hunger because that is a field I work in, but it might be useful at this point to ask my colleagues to add to that in terms of their own fields.

Chairman: Maybe it is easier to go along the table, starting with Professor Nicholls on sea level rises, then Professor Arnell on water, and Professor Haines and Ms Kovats on health.

(*Professor Nicholls*) Within the DEFRA funded work we have looked specifically at coastal flooding, as Professor Parry has just described, and also some work on coastal ecosystems. I think it is worth noting that sea level rise and climate change in the coastal zone will have a number of effects, so these are only a selection of the effects. It will also promote erosion, and saltwater intrusion and other types of hazards will be exacerbated. Many people will experience a number of different problems in the coastal zone. Speaking specifically about the work on flooding, there is a large increase in the number of people likely to experience flooding under a situation of global sea level rise, particularly by the Hadley Centre model, and no specific adaption to try to do anything about it. The regions that seem to be most vulnerable are quite similar to the ones Professor Parry mentioned. Africa stands out, I think reflecting the adaptive capacity of that region, and also South and South East Asia, because of the large number of densely populated deltas that are found in that area. Also another area which stands out very strongly in the work, not in absolute terms but in relative terms, are the small island regions—the Caribbean, the Indian Ocean and the Pacific Ocean. I think it is well known already that the Maldives could disappear with a metre rise in sea level. These regions all stand out as being particularly exposed and, in various terms, more exposed than any other part of the world. There are specific problems with coastal areas.

(*Professor Arnell*) In terms of water resources, the two key water-related effects of climate change are on the supply of water to a whole range of users in agriculture and the public, and impacts on river flooding. There are other aspects which are also important to do with power generation, health and agriculture particularly, but I will not go into those at the moment. When it comes to the more specifically water-related impacts—like a change in the water supply and a change in floods—it is important to distinguish between the hydrological changes which are driven by the climate change, and the impacts of those changes which are very much influenced by the way in which the exposure to water shortage or to flood risk changes; whether it is due to population growth, economic development, adaptation to climate change or not, adaptation to current climatic variability. There is an important distinction between the effects of the change in the hydrology and the impacts of that on human societies. In general terms, the hydrological changes are driven almost exclusively by the changes in rainfall that the climate models project, which vary; but there are some very strong consistent patterns. One of the consistent patterns is that large parts of Southern Africa, under virtually all the scenarios we have looked at, are likely to get dryer with implications for stream flow and the amount of water that is potentially available. That is a very consistent pattern. A large part of Southern Africa is drier with reduced water availability. Other developing region areas are less clear at the moment. In West Africa and Southern Asia the signals are dependent to an extent on the climate model projections. That is important when we come to consider the potential implications for climate change. What is also becoming clear is, the way society and the economy manages water shortage and water excess influences to a large extent the implications of the change in climate for water resources and flood risk.

(*Professor Haines*) Health, of course, is downstream of many of the impacts that my colleagues have talked about. The relationship between health and climate is relatively complex, because there are a number of pathways by which climate can affect health. An obvious pathway is the direct effect of rises in temperature, resulting in an increase in the frequency and intensity of heat waves in summer months, particularly in urban centres. Some work we have been doing at the London School shows that the relationship between temperature and death rates is different for different cities around the world. For example, in a city like Delhi there is very little cold-related mortality in the winter months; it is almost all related to an increase in temperature in the warmer months. That suggests there would be very different responses in a city like Delhi to climate change than in a city like London, where there is high cold-related mortality, and there may be some benefits of warming winters. The other direct effects, of course, are related to extreme events which my colleagues have outlined. There are a range of effects of flooding on health; the most obvious ones are increases in communicable diseases—diarrhoeal diseases and so on; but increasingly we are also beginning to understand that flooding can have major impacts on mental health, which can last for long periods; changes in behaviour amongst children; increases in depression amongst people being flooded; increases in suicide rates. Martin Parry alluded to the effects of reduced crop yields. Our main concern is the impact of these on malnutrition in vulnerable populations, as he said, particularly in Africa. A topic, which of course many of you will know about from the media, is the potential impact of climate change on so-called vector-borne diseases; these are diseases which are carried by mosquitoes and other vectors, and malaria is the most important of these. Currently about 2.4 billion people are at risk of malaria worldwide. The impact is largely, but not entirely, on children. About 7 per cent of 11 million deaths a year, of children under five, are due to malaria. It is therefore a very important disease on a global scale. At the moment we are still at the early stages of vaccine development.

[**Chairman** *Cont*]

There is not an effective vaccine, and there is not likely to be one in the next few years. The concerns have to be changes in malaria distribution possibly at the latitudinal edges but particularly at the altitudinal edges of distribution in parts of Africa and other parts of the tropics. There are many other vector-borne diseases which are likely to be climate-sensitive; including some of the virus diseases which you may be less familiar with, such as dengue. Probably about 3 billion people are currently at risk of dengue; it does not cause as many deaths as malaria but it is, nevertheless, an important infection in many parts of the world. There are many other examples of viral diseases transmitted by insect vectors that I do not have time to go into. Many of the other "tropical" diseases, and particularly their insect vectors, are climate sensitive but their incidence and distribution may also depend on other environmental factors and, in some cases, on the effectiveness of disease control programmes. The estimates that we work on are related by and large to the short-term relationships, by and large, between temperature, humidity and disease. We obviously have to try and extrapolate those forward into the future. That clearly does give some uncertainties to the work; but, nevertheless, I think we are getting a much better understanding now of the relationship between climate and disease; and that is reflected, in some of the work that is being done at the moment and will be done in the future. I will hand over to my colleague, Sari Kovats, to say a few words about the malaria work.

(*Ms Kovats*) To answer the question about how easy it is to detect changes attributable to climate change, obviously it is extremely difficult because human disease is caused by many factors. Also, in developing countries there are very few data series for the last 20 years of sufficient quality to answer those questions. We have recently conducted a review to look at all the information that is available; and three local studies do indicate that climate change may have increased highland malaria in areas of Rwanda, Ethiopia and Pakistan. Obviously we cannot exclude all other alternative explanations and it is possible that drug resistance has increased cases. The IPCC has reviewed information on studies of changes in the distribution of insects. We know that climate change has already affected distribution of some insect species in certain areas. There is one study which shows that ticks may be moving north in Sweden and that human disease may have changed as a result.

Mr Robathan

41. In terms of development aid, if there were a better infrastructure for delivering particularly mosquito eradication programmes, would it be relatively easy to counter this rise in malaria in developing countries?

(*Professor Haines*) About 30 per cent of the population in low income countries have access to some form of treatment; and probably only about 2 per cent actually have access to effective preventive activities in relation to malaria according to a recent WHO estimate. There are large areas of the world where there are no effective preventive programmes, particularly vector-control programmes. Of course the other issue which is relevant to prevention is the provision of insecticide-treated bed nets, which does reduce malaria appreciably but does not often reach many of the poorest populations. To some extent, by providing improved effective vector-control programmes and bed nets you could substantially reduce mortality from malaria. Nevertheless, I think it has got to be seen as part of an overall programme where we also provide more effective treatment and perhaps, ultimately an effective vaccine which, as I have said, is still some way away.

42. Could I ask you to home in on vector-control, which has worked in various areas.

(*Ms Kovats*) It is not a question of vector-control in hyper-endemic areas—where you use bed nets. The main climate change effect will not be in the very endemic areas, in sub-Saharan Africa, it will be at the fringes of distribution where malaria is unstable, where they have not had malaria epidemics very often and they are not very well prepared. Here, the population has very little immunity and mortality during an epidemic is very high in all age groups. It is those areas which are vulnerable to climate change and they are mostly in the Highlands of East Africa, Papua New Guinea, Laos and Vietnam. Activities there are focussing on epidemic forecasting. There is very little research at the moment on the use of climate information to forecast epidemics and to target limited resources. If you just had an extra bit of information about the risk over the coming year then you could use your resources more efficiently by using climate information.

Chairman

43. You mentioned a lack of data in some countries—is there enough research observation being done in developing countries in this area in relation to your own respective disciplines? Perhaps you could tell us what work is being done in developing countries in your areas of study. Do you think it is enough; and how could it be enhanced?

(*Professor Nicholls*) There is a lot of work going on in a number of developing countries on the issue of potential effects of sea level rise and, more broadly, climate change on coastal areas. I think most of that work is looking at what might be exposed to the impact of sea level rise and climate change. I think an area where there is less work is what we might do in terms of responding to it—we need focussed research to look realistically at adaption—and I think we are going to hear about that in the next session in a more general sense. That is one area where a lot more work needs to be done. Another area that handicaps us is just simple information about things like where people actually live. Talking about the work I do broadscale, we had information on where vulnerable populations are but that data could be much, much better. We are working on a new project right now to try and actually improve and bring some of that new data in. There are a lot of different things that could be done at a range of levels. I think in the developing world there is a need to think not just about how climate change might affect an area, but this issue of

[**Chairman** *Cont*]

how we can respond, and how the local population can respond; and what policies in addition therefore need to be implemented to deal with these problems.

(*Professor Arnell*) With the area of water, the IPCC's most recent assessment showed there were very, very few studies of potential climate change on water in developing countries. The vast majority of the work that is reported there is from Europe and North America effectively; very little is done in developing countries, and there is very little done in Africa particularly. There are a number of reasons for that. One possible reason, and this is widely acknowledged amongst hydrological organisations and meteorological organisations, is the lack of data on hydrological conditions, across large parts of Africa particularly, and the situation is getting worse rather than better as records are more and more collected, stored and so on. There are initiatives by the Royal Meteorological Organisation and others to try and address this; but this is a big problem in detecting a trend, looking at the variations in stream flow, looking particularly at the hydrology now, and looking at how unusual recent behaviour has been in the context of the past. The records, in many cases, are just not there. That is a big problem in many parts of Africa.

(*Professor Parry*) Generally speaking, the case would be across all of us, Chairman, that there are an inadequate number of studies being done on impact and adaptation in developing countries as a whole; and there is an incredible imbalance of information available between the north and south in this respect. In addition to that, my impression is that those studies being undertaken and funded by different countries are not well coordinated. One wonders how much agencies of wealthy countries, such as DFID, are able to coordinate with their own equivalents in France and Germany—simple things like establishing the same climatic projections to work with, so that one can compare like with like impacts and adaptations. I think it is very important to have this coordination so that we have a set of impact studies so we can then ask the question: what do we need to adapt to? We need to get those impact studies first. The second area in which work, to my mind, is lacking but beginning now is the effect on impacts not of the climate change but of the different development pathways. So much of the impacts, the magnitudes and differences in our work stem from the different levels of exposure to the climate change. A global population in a sustainable development pathway shows up perhaps a third less of the impacts in terms of risk of hunger than the business of usual globalised pathways; but these studies have not yet been conducted: that is, of the differences of impact to climate change and the different development pathways.

44. You made some predictions on food shortage in your earlier comments: is there sufficient data in these predictions in developing countries; and how certain are you about those predictions?

(*Professor Parry*) The number of studies that have been done in this area are few, perhaps less than half a dozen. There are three or four other research teams apart from ourselves. There are certainly differences in the projected outcomes; but the overall figure is the same—that is, an increased number of people at risk of hunger; a reduction in global food production leading to a rise in price, leading to the risk of hunger. I might just add a little more detail to that. Broadly speaking, from the IPCC, one can see something like a projected estimate of a yield reduction, due to climate change, of between 5 and 10 per cent worldwide, leading to something like the equivalent downturn in global food production, from what it is projected by FAO otherwise to be in a future without climate change. Indeed, in food production it is not necessarily the case that the greatest yield reduction in terms of million metric tonnes are in developing countries. Most changes would be in the world's bread basket areas, Australia, Central Europe, the United States and the Canadian Prairies. Saskatchewan, for example, produced about a fifth of the world's traded wheat; and changes here would greatly affect global wheat prices and other food prices. Ultimately, risk of hunger depends on one's ability to pay, as well as one's ability to grow. It is those with low levels of ability to pay in poorer parts of the world that experience the adverse effect of that global price rise. It is a nice illustration of the importance of global studies of climate change, which may be adverse on parts of the world that are not the developing countries but knock-on through the global food system, in this case, into poorer groups and communities.

(*Professor Haines*) There are a number of areas where I think we still need quite substantially more research. One, of course, is the interaction between climate change and other environmental change. We are talking about climate change in isolation here today, but of course it is really one of a number of changes, including changes in land use. We know, for example, that deforestation can cause quite dramatic changes locally in distribution of diseases. The other areas would include the effects of extreme events like floods. I did touch on some of the impacts of floods, but there is still a lot we do not know about the full impact on health of floods, particularly in terms of many of the low income countries. What are the medium to long-term effects once the acute emergency has gone away? These may be more pervasive than we originally thought. We also need to get better data, particularly, as Sari Kovats has said, at the edge of the distribution of diseases by malaria, at the altitudinal fringes, for example, of disease distribution. With a very few exceptions, we do not have good data on long-term trends in the disease vectors, e.g. the mosquito or human disease in a number of these areas. It would be very helpful if we could set up longer term monitoring sites in potentially vulnerable locations. Finally, two other points: early warning systems—again, as Sari Kovats has pointed out—do show considerable promise, particularly where malaria epidemics may occur; we need to evaluate just how those can be operationalised and how they can actually integrate with the local health system and any programmes to spray for mosquitoes. Finally, perhaps slightly outside the remit today but nevertheless very important, the near-term health benefits of the greenhouse gas mitigation technologies, renewable energy technologies and so on. We have got a major energy gap; 2 billion people are without an adequate energy supply which has a very big impact on their health; and we need to evaluate the effects of

[**Chairman** *Cont*]

providing renewable technologies to that population which will have, in my view, quite substantial health benefits, in addition to whatever other benefits it may have.

(*Ms Kovats*) There have been very few studies that have looked at climate change and health in developing countries, and those all tend to be localised and disease-specific. I think what is needed is a proper impact and adaption assessment—at a regional or a national population level. Some of these have been done in developing countries sponsored by UNEP for their national communications to the UNFCCC. A good example of a research project that is setting up long-term monitoring in the East African Highlands is the DFID supported programme at the London School, which is looking at Highland malaria. They are in the process of setting up monitoring and forecasting systems in Uganda and Kenya so they can take into account the impact of the change in climate as well as all the other factors that affect malaria.

Tony Worthington: Our interest in this is in terms of how after investigation we would recommend DFID should change its policy. Let me tell you what I have taken out so far. There is nothing in climate change that would make me change DFID's policy by and large, because it is an additional reason for doing what you are doing. What I have taken out of this so far is that I would put a lot of money into reproductive health, so that everybody in the world has got the choice of having children, because numbers affect adversely all you are talking about. I would put a lot of money into basic education and the health service in general to give a sense of control; and I would intensify agricultural research and water distribution research in those countries. Would you agree with all of that, or disagree; or what have I missed out?

Chairman

45. I think the question really is: what changes in policy would you make both here and in developing countries?

(*Professor Nicholls*) One thing that was said, I think we are talking about a 20-year timescale—I think with climate change I tend to think of slightly longer timescales, maybe 50 years. Just reflecting back, I think that is one thing I noticed, that I would be thinking about longer term changes. In the coastal arena, there are certainly vulnerable regions, and I mentioned some of them a moment ago. I think it would be useful for an organisation like DFID to ask: where are the places where sea level rise and a climate change on the coast could matter? It would be nice to have some hot spot map which would help policymakers from a top down perspective think, Sea level and climate change are going to be an issue here.

Tony Worthington

46. That is not a DFID job, is it?

(*Professor Nicholls*) True, no, but that information would be useful for DFID to do its job.

47. Then to do what?

(*Professor Nicholls*) In terms of identifying those regions, those are the regions where, if one goes in and invests in something, one needs to ask the question: is climate change going to have an impact on this? Should we do it differently because of the risk of climate change?

48. It does not tell me what DFID should do in terms of its development policies?

(*Professor Nicholls*) The other thing one wants to focus on is also the capacity to manage the coast over these long timescales. I wonder if there is a tendency to think rather shorter term than longer term. I think one wants to bring in this notion of the 50-year timescale when you are thinking about an issue like developing coastal management.

Chairman

49. Is there an extent to which countries that are vulnerable are not wishing nor wanting to face up to that vulnerability; and is there an area there for DFID to help?

(*Professor Nicholls*) I would not say not face up to that. I think my view would be that often they have not got the capacity too. DFID could help with increasing that capacity, yes. I think I would reflect it be a little differently. I think DFID could help with that increasing capacity. I think that is all the way through as some of the other speakers have spoken, all the way from the science, to climate change scenarios, to what those impacts might be, to understanding the vulnerabilities and what we might do about it—a whole suite of areas, rather than just the climate change science. We have to go through all the actions that might be taken.

(*Professor Arnell*) I think the main thing that climate change challenges is really the assumption that the natural resource base we have got to work with is constant. That has been a long assumption—that the population may change and what is there in the environment is fixed. Climate change has challenged that really quite fundamentally. This is probably more appropriate at specific scheme levels or maybe strategy levels, but I think what DFID could encourage is an approach which considers the effect of different possible climate and, indeed, other futures on the viability of a strategy scheme (and there are some big questions there as to how you go about it), but considering what would happen if things were different with the climate, with the land use, whatever. Would that effect the viability of a particular scheme or strategy? The other thing which climate change has done, rather strangely, is led people to understand much more clearly the way climate varies naturally. Trying to unpick the climate change signal from climate vulnerability has triggered a lot of research into the nature of climatic variability. We are increasingly understanding the way that operates. We are increasingly recognising the additional assumption that one year is very much like another, whichever one comes out of the hat, and that assumption is not really appropriate any more. It is understanding there are several periods of unusual weather, even without climate change, which may be important for the way a particular scheme and a particular strategy operates. Not assuming that the resource base you are working with is constant is

[**Chairman** *Cont*]

one of the big lessons of climate change. Running through different possibilities, and that may open a series of issues as to how do you choose then what to do, given that you do not know what the future might be like—that seems to me to be one of the big challenges, which may challenge fundamentally the way some things are done, particularly the non-investment strategies and schemes.

(*Professor Parry*) Perhaps I could add to that, by saying I believe (and I think my colleagues' works shows this also in their fields) that there are a number of what we would call "win-win" strategies that DFID and its parallel agencies in other countries could adopt; which is to meet the challenge of short-term climate shocks, whether it is building resilience in agriculture, providing for efficient water availability, defending coasts near-term, which is largely its job; but, at the same time, that incidentally builds in resilience to long-term climate change, but not in every case. It makes sense to drought-proof agriculture in Africa short-term in ways that make it less drought-prone under long-term climate change. You could target near-term challenges, and also meet the long-term, and that targeting is now possible. Secondly, I have mentioned, I think there could be a good deal more successful coordination between different countries in the impact and adaptation studies that they are promoting. For example, DEFRA is funding studies in China and India, you heard on January 9 and I was reading about. I would be surprised if there were not other studies being funded in those countries, or in Pakistan and Sri Lanka, for example. I would be surprised if they were based upon the same assumptions but we would gain a lot from them being. Finally, I think there is an important realisation growing in the research community that needs to be translated through you and others to DFID and like-minded agencies that adaptation is going to be essential; that mitigation is not going to avoid the problem. It will take 10 or 20 times the current Kyoto level of emissions draw down to avoid significant impact, and this scale of mitigation simply is not going to be feasible. Looking at how climate is going to change sustainable development is, to my mind, not the whole issue. From our point of view it is clear that, unless there is a sustainable pathway there are going to be millions at risk. Sustainable development is an imperative pathway if we are to avoid those. Climate change policies, to be effective, need to be part of a sustainable development pathway. It seems to me that that thinking of this kind needs to begin and start to make itself felt in policies of DFID.

(*Professor Haines*) Yes, I endorse obviously what my colleagues have said. I would like to make three points: firstly just to re-emphasise the importance of capacity building particularly in the south, either by south-south collaboration, or by north-south collaboration. I think one of the messages that comes through today is that it has to be multi-disciplinary. You have seen the spectrum of the disciplines here this morning, and they need to be linked in with climatological research; that, I think, is a very important area. That will allow much better long-term planning; but also, as Martin has said, near-term benefits in terms of improving our capacity to adapt to climate variability. One specific example of that is the El Niño phenomenon, which of course is a natural phenomenon which may well be affected and perhaps is already affected by climate change. We know from studies around the world that this has a major impact on health in all sorts of ways, by increasing the rate of disasters, by changing malaria incidence and so on. If we could strengthen the capacity of low income countries to respond to the El Niño by more proactive planning within the public health sector, that could have major benefits for long-term adaptation to climate change. That is just one specific example. The third area I would talk about is surveillance. As we have mentioned, surveillance of climate-sensitive diseases and health indicators, particularly on the edge of current distribution, in my view would be well worth investing in to give us early warning of whether disease distribution is changing and, if so, whether it is likely to be due to climate. The long-term collection of data, in my view, is a good investment.

Mr Battle

50. In all of this what is coming across strongly is the need for more accurate data. Who would collect it? Would it be institutes, universities, professors from the north who may take an interest in the country and go out and do some research there; or are there real efforts within the developing countries, if not within their own universities, is there work to do to strengthen that capacity? Are there alliances between north and south universities, as it were? Where will the money come from to collect the data and to put that capacity in at the first stage?

(*Ms Kovats*) That is already happening. DFID supports demographic and disease surveillance activities; there are several demographic and household surveys going on in Tanzania, for example. All that information (which is not specifically to address vector-borne diseases) is used to target the health services in that country and it is done through the ministry of health and is seen as a capacity-building activity. Some of that work could then be additionally targeted to more climatic-sensitive diseases.

51. At the lower levels?

(*Ms Kovats*) Yes, through the national ministry of health, but supported by DFID and in collaboration with universities in the north.

52. At that level of ministries of health or universities and institutes is there the capacity and is work being done on actually analysing the impact, given the future, the timescale possibilities? Are people being as realistic as they can, using the international information; are people doing real impact and risk assessments at the local level?

(*Ms Kovats*) Specifically on climate change and health impact assessment in developing countries, there have been very very few. That is something we think should be done.

(*Professor Parry*) At a guess, there are perhaps two or three dozen country-level studies underway that are either funded by the World Bank, or by agencies such as DFID that we know about and are, in a sense, modelled on quality controlled and comparable yardsticks which the IPCC tries to put out. In addition, no doubt there are many, many hundreds

[**Mr Battle** *Cont*]

of studies being conducted at the local level. When these studies are formulated they are not placed in the global context; they do not have similar sets of assumptions; they are not measuring the same things; their researchers are not in touch with their colleagues in neighbouring countries, or vertically with the IPCC. Consequently, a lot of the value of those studies is potentially being lost, and it is difficult to draw together an international picture. Although the impacts are local, and the adaptations indeed have to be devised locally, it is the international picture which affects a lot of this local pattern.

53. You surprise me there, and I know a shortage of energy means you cannot plug in, but with new technology, with internet connections and the scientific world sharing data and coordinating data, is it the lack of gear, as it were, hardware and software, or is it the lack of will to do it and organisation?

(*Professor Haines*) I think from the health point of view it is a combination of factors. One is that collecting data is obviously a lower priority for many countries than trying to struggle with the every day realities of the health system; so it is way down the priority list; which is one reason why DFID, for example, might put some resources into making sure that long-term data collection is occurring and people are availing themselves of the opportunity to connect with the internet, for example. That seems to me to be a very good potential investment for DFID. The other thing is, as we mentioned before, the capacity issue. We know there is a tremendous brain drain of scientists, say, from Africa. The majority of African scientists are not working in Africa. We do need to strengthen capacity by helping to make it possible for African scientists to stay in Africa with adequate resources and adequate infrastructure. That, again, seems to me to be the important message.

54. Universities are very young, but are the key scientists here (because environmental study is very popular in our universities now) keen to go to Africa and South East Asia as a place to do their work because they see it as a priority, to collaborate that way?

(*Professor Haines*) At the London School we have a number of people who doing PhDs or Masters projects who are going out to Africa, and to parts of East Africa in particular and doing this kind of work, but what is really essential is the long-term commitment. One can certainly learn something from short-term studies, but it is the long-term that counts.

Chairman

55. The impression is that quite a lot of work is being done internationally and nationally but no-one is actually putting it together. Who should be doing that? Should that be done, so far as health is concerned, by the WHO, and coastal defence and water in relation to UNEC? Who do you see as the natural agencies for drawing that work together?

(*Professor Parry*) There is a natural agency which draws together the results and conclusions of those studies, which is the IPCC. I think more the major issue is formulating these sets of studies and developing the data sets or, more specifically, making them available in a coordinated way. In other words, the front end of the research issue. At the moment a lot of the effort devolves upon the World Climate Research Programme, WCRP, the International Geosphere Biosphere Programme, the IGBP, and the International Human Dimensions Global Change Programme, IHDP. Those are the three international research groupings that have developed in their own right as a result of the scientists' interests that attempt to coordinate this research. They are funded at an extremely low level, with small grants from the Royal Society and their equivalent bodies in other countries. There is no UN funding input and, as far as I know, there is no major country level DFID-type input. In a sense, there is this quite loose and rather leisurely structure, but it is not being funded urgently at the international or government level; it is rather being funded and pushed along by the researchers themselves and their own network.

(*Professor Haines*) Could I just add to that? The WHO European Centre for Environment and Health in Rome has done some very useful work in coordinating climate and health researchers in Europe; but if you look globally the situation is not as good because the Geneva headquarters of WHO has one part-time person on climate and health. That is inadequate to coordinate the surveillance and research programmes that are needed.

(*Ms Kovats*) WHO at the moment (and I am involved with this) is specifically trying to develop guidelines for developing countries to undertake health and climate change impact assessments. The WHO would not have the capacity to support individual assessments in individual countries, and that is what DFID would be able to do.

Mr Robathan

56. Just relating to Professor Parry's comments, you particularly stress in your paper headed 'Climate Change and Sustainable Development'[1] that, "A world with . . . lower population levels will experience much smaller levels of negative impact from climate change . . .", and you stress the importance of population levels. DFID has a very good programme on reproductive health assistance, and I know various members of the Committee are concerned about that matter. Also, we all understand that it is quite a sensitive area, but you stress it. What do you think we could do in policy terms to encourage what is globally, in your opinion, extraordinarily important?

(*Professor Parry*) Perhaps by way of a bit more on that, because this group is just now beginning to calculate those millions at risk for different world futures. The IPCC has developed a set of characterisations of world futures. One is, in a sense, a sustainable development plan and they have called it B2, and one can read about it at length in this report; and the other is a sort of business as usual

---

[1] Ev 39.

[**Mr Robathan** *Cont*]

pathway, as you or I would call it, with the global population in 2050 at about 50 per cent again as much as in the sustainable development future. These are well characterised now in quantitative and narrative terms. We are just beginning to complete, as it were, the first set of studies. There are millions at risk of water and coastal flooding and at risk of hunger. The numbers adversely affected are potentially much, much lower in a sustainable developed world with a population a few thousand million less, let us say, than in the business as usual world. It is not so surprising when you think those extra 2,000 to 3,000 millions are in Africa and South East Asia; they are the exposed population. Which is why I said, without asking my colleagues here, that the policies of climate change, as is emerging from our and others work, have to be (to be successful) placed in the context of an integrated strategy for sustainable development. They will not work otherwise, because impacts are all about exposure, as much as anything else. You ask me, what can we do about it, and there I begin to get lost because it is not really my field. I hope, having said that, that there are enough people in DFID to look at the ways in which sustainable development can be promoted in order to reduce that exposure. I know I have not been able to answer your question properly because I do not feel qualified; what I have tried to do is to put the issue out there in ways that others can answer it more effectively.

57. It is terribly important. You give it priority. Sustainable development means many things to many people; but you would say that sustainable development is very closely tied into the need to limit population growth?

(*Professor Parry*) No, not just that by any means. These characterisations of a sustainable world by the IPCC, specifically the B2 world, are ones in which one has a much more resilient drought-proof agriculture which is using water in a much more efficient way. Income is spent on defending its coasts; which has lower levels of population, which have much higher levels of income, which incidentally do not use fossil fuels at the same rates. It is a whole package which makes a population not only lower, but much more resilient to those knocks that would come from climate change. I do not think, by any means, it is simply a case of fewer numbers of people. I may have used that as an example to characterise these different worlds; but there are very many characterisations that make for that world and make for its increased resilience over and above the business as usual world.

Ann Clwyd

58. Professor Haines, I think you said that the majority of African scientists are working outside Africa. Where are they working? Is the same true of South East Asia?

(*Professor Haines*) I do not have figures for South East Asia. In terms of African scientists, many of them work in North America, and to a lesser extent in Europe. There is a real problem of how to stem this brain drain. It is not just a question of scientists, but also the health profession; there are many doctors and nurses working outside their country of origin. It is a real problem and I do not think the world has yet got a regulatory system to allow us to deal with that. The fact is that we and particularly the US benefit greatly from the import of professionals trained at very low cost to ourselves and themselves, yet there is no system by which we can pay that back.

Chris McCafferty

59. I have a question for Professor Parry, just taking you further on Andrew's point about population and sustainability, because obviously we are looking at the impact on DFID's policy: would you agree, and perhaps I could open this up to other members, that it would be a useful tool in developing a sustainable policy and helping people defend against climate change if DFID was to increase its percentage of ODA it spends on sexual and reproductive health? Obviously that is an issue, but would you agree that that would be a good way of DFID's spending its money overseas?

(*Professor Parry*) I am sorry, I am not really equipped to answer that.

(*Professor Haines*) I think there are good reasons for doing that anyway, irrespective of climate change. As Martin said, population is one element and the other element, of course, is the excessive, in many people's eyes, use of fossil fuels by the industrialised countries. If you look at the relative contribution, it is the very high per capita emissions of greenhouse gases in industrialised countries which is even more important in driving climate change than the emissions from a much larger population in low income countries at this stage. Of course, as the population in low and middle income counties starts to develop and require more fossil fuels then unless renewable energy sources are widely used their contribution to climate change goes up, so ultimately both population and per capita emissions are important. I suppose it is another argument really for investing more in reproductive health. We need to put it in context. The recent WHO Commission on Macroeconomics and Health, has tried to chart a path for the future in terms of developing sustainable health services. It has pointed out that the average low income country spends very little per capita on health[2]; but you cannot provide adequate primary care, including reproductive health, for that kind of money. They have suggested maybe $30-45 per capita per year would be necessary for a sustainable very basic health system. That is what we have to move towards. We have to mobilise money internationally and, as much as we can, within the country to develop that basic primary care system which will provide sexual reproductive health as well as the other basic primary care.

Chairman: Thank you very much for coming to give evidence today, and making plain to us areas of policy and science which is actually quite complex. We are very, very grateful to you.

---

[2] For example, the 48 least developed countries on average spend only $6 per capita annually from their budgets (with another $5 per capita or so coming out of pocket expenses).

Memorandum submitted by the Tyndall Centre for Climate Change Research

GLOBAL CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT: VULNERABILITY AND ADAPTATION

INTRODUCTION

Achieving sustainable social and economic development both in developing and developed countries is harder under conditions of climate change than under conditions of climate stability. The aims of the UK Department for International Development (DFID), as set out in the International Development Targets which seek to reduce poverty, are all likely to be affected to some degree by the impacts associated with climate change at global and local scales. International assessments such as the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) have begun to address the development, sustainability and equity aspects of climate change. The underlying vulnerability of populations to climate change is determined by social, institutional and economic factors coupled with their sensitivity to climate change impacts. There are invariably opportunities for adaptation to climate change, but these must be facilitated within the wider development and social context.

The UK government is committed both to realising the goals of the UN Framework Convention on Climate Change through the Kyoto Protocol and to contribute to the World Summit on Sustainable Development in 2002. The Third Assessment Report of the IPCC states that the global average temperature is likely to rise above the 1990 level by between 1.4 and 5.8°C by 2100. Some of this warming has already been experienced, although the associated impacts remain difficult to identify with certainty given the confounding factors of natural climate variability and social change. The longer-term impacts of climate change, however, will include shifting supply and access to key resources. These changes will constitute major challenges to the sustainable achievement of the human development and environmental aspects of the international development targets. Efforts around the nascent Climate Adaptation Fund of the UN Framework Convention on Climate Change are increasingly focussing on seeking sustainable adaptation strategies in combination with reducing overall emissions trajectories.

The impacts of future climate change will be clearly socially differentiated impacting on the poorest countries in the world and potentially threatening development efforts. The Committee has already recognised in its initial questions the potential impacts on least developed countries. The latest reports from the Intergovernmental Panel on Climate Change show that small island nations, particularly the low-lying atoll nations, are particularly at risk, while large numbers of people reliant on weather-sensitive resources for their livelihoods, from monsoonal Asia to dryland Africa are also likely to be negatively affected. The impacts of future change will be felt on resource-dependent communities and in a multitude of primary and secondary effects cascading through natural and social systems. Here we address four key issues: vulnerability and adaptation, the impact of climate change on inequality, factors that increase vulnerability, and strategies for adaptation. These are key issues in the formulation of sustainable development strategies. We conclude with a number of recommendations.

ISSUE 1: VULNERABILITY AND ADAPTATION

People's vulnerability to (ie their capacity to be harmed by) climate change depends not only on the likely responses of the systems on which they depend, but also on the ability of people and systems to adapt to change. The vulnerability of a system to climate change is determined by (i) the likelihood of occurrence of an unusual climatic event (climatic *exposure*), (ii) the physical setting of the system (physical exposure or *sensitivity*) and (iii) the ability of the system to adapt to change (*adaptive capacity*). A system may be a local community, a particular economic group or industry, an agricultural system, a transport network, or a whole society or country. An unusual climatic event may be a storm, a drought, or a long-term change to a new climatic regime. Sensitivity will be high where the system in question includes, for example, settlements built on flood plains, hill slopes or low-lying coastal areas. Adaptation may take the form of reducing dependence on vulnerable systems (for example diversifying food production away from a limited number of drought-prone crops), of decreasing sensitivity (by avoiding building settlements and infrastructure in high-risk locations), or by strengthening existing systems so that they are less likely to be damaged by unusual events (such as building houses on stilts or improving drainage in flood-prone areas).

Given the uncertainty inherent in climate change scenarios, it is difficult to quantify future exposures, although exposure is likely to increase for developing countries, as discussed in the next section. However, sensitivity and adaptive capacity as defined here are not dependent on climate. They may be measured using contemporary and historical data and interventions may be made in order to decrease sensitivity and increase adaptive capacity. The Tyndall Centre is currently funding a project whose aim is to develop indicators of vulnerability, sensitivity and adaptive capacity, using socio-economic and geographical data, and data relating to natural disasters and their consequences over the twentieth century. This research demonstrates that different geographic and socio-economic factors cause vulnerability to *current climate variability* to vary greatly between countries. A country (or system at a sub-national scale) that is vulnerable to current climate variability will also be vulnerable to the impacts of future climate change. Priorities for adaptation may therefore be identified by examining the distribution of high-impact natural disasters in the recent past—the worst affected countries will be those that will benefit most from carefully targeted adaptation measures that are implemented within the framework of sustainable development programmes.

ISSUE 2: IMPACTS OF CLIMATE CHANGE ON INEQUALITY

Developing countries are situated predominantly in tropical and sub-tropical regions. They are therefore particularly exposed to climatic hazards such as droughts and floods, which occur as a consequence of high rainfall variability (both phenomena) and the development of tropical storms (floods). The IPCC[19] reports that future increases in sea-level and temperature are likely to increase the mean and peak precipitation intensities associated with tropical storms, increasing vulnerability to flooding and landslides, such as caused the large loss of life associated with Hurricane Mitch in Central America, particularly in Honduras and Nicaragua, in 1998. Increasing populations in economically productive coastal zones (due to birth rates and migration) will also increase national vulnerability to tropical storms via increased potential mortality and damage to physical infrastructure. Economic damage from such events is considerable, often running into billions of dollars.

The IPCC also reports that, while mean rainfall is likely to increase over many areas in the mid and high latitudes of the northern hemisphere, the frequency of extreme rainfall events is likely to increase everywhere, as will rainfall variability. Increased rainfall variability will increase the risk of drought in semi-arid regions such as the African Sahel, and more frequent extreme rainfall events will increase the likelihood of crop damage and flash floods. Increased isolated heavy rainfall events are also likely to increase the rapidity and severity of soil erosion, which may in turn increase dust storm activity, a serious health hazard in arid and semi-arid zones.

It is therefore highly likely that the adverse impacts of climate change will be felt disproportionately by developing nations situated in the tropics and subtropics, particularly those already vulnerable to drought, soil erosion, sea-level rise and tropical storm damage. Within these countries, the poor will be the worst affected, due to poor housing situated in the most exposed locations (for example on unstable hillsides), and a lack of capital with which to purchase foodstuffs in times of scarcity. Poverty is also associated with a lack of access to healthcare, and with a lack of coping capacity generally. Climate change thus has a very real potential to increase inequality both between and within nations, as the poorest nations and communities suffer the greatest adverse impacts on mortality, health, infrastructure and economic well-being. These impacts are likely to have negative effects on social, political and economic stability, making the countries affected less attractive for foreign investment and therefore inhibiting economic growth as conventionally measured, increasing the gap between rich and poor nations. Perhaps more importantly, increased exposure will jeopardise sustainable benefits from development investment unless such investment includes adaptation measures designed to enhance the coping capacity of developing countries.

ISSUE 3: FACTORS AFFECTING VULNERABILITY

Ongoing research at the Tyndall Centre is attempting to identify how social groups and sectors of the economy are vulnerable to climate change. In South East Asia, for example, previous work by UEA researchers funded by the ESRC[20] showed that vulnerability within localities is determined by levels of poverty and the distribution both of wealth and income, but also the distribution of power within communities. Vulnerability, therefore, is mediated by institutions of governance. In the field of impacts of natural hazards and disaster relief it has long been known that catastrophic events typically reinforce underlying inequalities. Our research in Vietnam and elsewhere has demonstrated that vulnerability to long-term change fits the same pattern—there will be winners and losers from climate change but the losers are likely to be those already marginalized.

This research also demonstrated how governance issues are key in preventing maladaptation, and that there is potential for institutional change to increase and exacerbate vulnerability. Economic liberalisation and the negative impacts of economic globalisation can undermine social mechanisms for coping with climate change and climate variability. This has been shown through careful empirical work in developing countries faced with present day weather extremes that are likely to be exposed to significant impacts of climate change. Furthermore, trajectories of economic development vary between countries, and a development model that is appropriate in one case may be inappropriate in another. For example, an emphasis on urban industrialisation and export-driven agriculture is unlikely to solve problems of rural poverty, and may well exacerbate them, particularly in countries that have a large rural population of subsistence farmers. Work supported by DFID, ODI and ESRC[21] shows that a shift from cash crops to food crops and from artificial fertiliser to animal manure, and an emphasis on diversity in both crop types and income sources, has facilitated sustainable agricultural development in marginal regions of Africa and reduced vulnerability to drought and famine. Strategies such as these are far more appropriate to sustainable development in Africa than programmes that aim to increase economic productivity per capita, which generally exhibit an urban bias and further marginalise the rural poor.

---

[19] Intergovernmental Panel on Climate Change (2001) *Climate Change 2001: The Scientific Basis*, WMO/UNEP.

[20] Adger, W N, Kelly, P M and Ninh, N H (eds) (2001) *Living with Environmental Change: Social Vulnerability, Adaptation and Resilience in Vietnam*. Routledge: London.

Issue 4: Strategies for Adaptation

Adaptation to climate change is not a costless exercise and investment in adaptation strategies will also inevitably result in winners and losers. In addition, the nature of uncertainty concerning the scope and magnitude of climate changes suggests that some adaptation strategies may turn out to be redundant, or in the worst scenarios, may actually be offset by maladaptation in other policies and sectors.

Thus international development assistance appropriately targeted which brings about sustainable development can enhance adaptive capacity in the face of climate change. Policy recommendations on enhancing resilience and alleviating vulnerability should be targeted more carefully at particular groups and sectors, rather than simply stating that one country or region is relatively more vulnerable than others. The key problem is the identification of adaptation options that minimise the impacts of climate change on the most vulnerable parts of society. Planned adaptation at the international scale could, for example, include collective investment in plant-breeding research for agriculture, early warning systems for food security, development of transferable infrastructure technologies for coastal defence, underwriting of particular insurance markets and other potential investments. These areas potentially could be supported by DFID and other donor agencies where they coincide with the objectives of the International Development Targets. But the range of planned adaptation investment for individual countries is more limited and specific to the geographical and development circumstances. Planned adaptation in general forms only a part of overall coping. Spontaneous reactive adjustments in resource use and livelihood will be required by communities whose livelihoods are directly or indirectly weather-dependent.

This adaptation must be facilitated through governance structures that enhance adaptive capacity, and again are geographically and culturally specific to different countries and regions. A key aspect of adaptation is that it is highly context specific and in order to have sufficient ownership from a broad array of stakeholders it needs to be carried out in a process-oriented multi-stakeholder dialogue mode at national and regional levels.

The ability to adapt should be enhanced through international development assistance. But this does not mean that resource-dependent communities are victims of climate change—people have adapted to climatic changes throughout human history and will continue to do so. Assessments of the future impacts of climate change often utilise modelling of alternative future scenarios to quantify impacts and risks and project that millions of people may be in danger because of climate change.[22] Such approaches give important insights into the scale of the question. But research at the Tyndall Centre has also shown that many aspects of adaptive capacity are, in effect, latent in the networks and information of those likely to be affected. Evidence on adaptation strategies adopted by farming, fishing and other communities throughout the developing world suggests, though this has yet to be tested, that some groups within society may be less at risk than modelling studies portray because of this latent ability to cope in times of stress.

Migration, for example, is a coping mechanism used throughout history by societies as part of their resource utilisation strategies and as a means of coping with climate variability. Indeed migration, including to urban centres, continues to play an important role in livelihood resilience to the present day in many parts of the developing world. There is a high degree of certainty that areas of the present day developing world will face greater incidence of extreme weather events in the future. If desirable migration is not available to those affected, it may ultimately increase the necessity of displacement migration, typically undertaken as a last resort when other coping strategies are exhausted.

There is emerging evidence from Brazil[23], Vietnam[24] and the small island developing nations that new migrants even to frontier areas build up knowledge of the local environments to promote sustainable utilisation of resources. Migration would appear to be a feasible climate adaptation strategy in particular circumstances and particularly for small island nations, which, regardless of past or future vulnerability, will be particularly vulnerable to inundation due to sea-level rise; some of these states may disappear altogether by the end of the twenty first century.[25] But the right to migration, particularly international migration at a time when there are increasing inequities in international labour flow practice[26], is likely to be increasingly contested.

---

[21] Mortimore, M and Tiffin, M (2001) Livelihood Transformations in Semi-arid Africa 1960-2000, proceedings of a workshop arranged by the ODI with Drylands Research and the ESRC, in the series "Transformations in African agriculture", Drylands Research, pp 26.

[22] Parry, M, Arnell, N, McMichael, T, Nicholls, R J, Martens, P, Kovats, S, Livermore, M, Rosenzweig, C, Aglesias, A and Fischer, G (2001) Millions at risk: defining critical climate change threats and targets. *Global Environmental Change* 11, 181–183.

[23] Muchagata, M and Brown, K (2000) Colonist farmers' perceptions of fertility and the frontier environment in eastern Amazonia. Agriculture and Human Values 17, 371–384.

[24] Adger, W N, Kelly, P M, Locke, C, Winkels, A and Huy, L Q (2002) Migration, remittances, livelihood trajectories and social resilience. Ambio 31, in press.

So when faced with significant changes in climate regimes and weather extremes in the future, different societies will clearly adopt radically different strategies. Their ability to make a sustainable transition will be determined in part by their underlying vulnerability and in part by governance issues. Thus vulnerability to climate change cannot be divorced from the wider sustainable development questions. Climate change gives greater urgency for the international development community to tackle these issues head on.

RECOMMENDATIONS

The Tyndall Centre makes the following conclusions and recommendations regarding strategies on climate change and sustainable development:

1. Vulnerability to climate change should be assessed on the basis of recent vulnerability to extreme weather- and climate-related events.

2. Small island states with large amounts of land close to sea-level are particularly vulnerable regardless of historical vulnerability, as they may be literally inundated as sea-levels rise.

3. Low-lying small island states and countries with high levels of poverty and high mortality rates from natural disasters are priorities for adaptation funding.

4. New adaptation funds must be supplemental to current development investment, and not a substitute for it.

5. Adaptation measures should include planning, forecasting, and institution building. The international community must recognise the right of people to migrate where climate change is likely to make their livelihoods untenable.

6. Planned adaptation measures must take careful account of local realities, and care must be taken to avoid maladaptive practices and practices that inhibit autonomous adaptation.

7. Conflicts between economic liberalisation and sustainable development should be identified and efforts should be made to ensure that economic globalisation does not have maladaptive consequences for developing countries.

Tyndall Centre for Climate Change Research

January 2002

---

[25] This is also the case for the British Overseas Territories. See the work for DFID by Natural Resource Institute and Tyndall Centre researchers—Sear, C, Hulme, M, Adger, W N and Brown, K (2001) The Impacts of Global Climate Change on selected Overseas Territories. Report to DFID Overseas Territories Unit. Natural Resources Institute and Tyndall Centre for Climate Change Research, University of East Anglia. pp 101.

[26] O'Neill, B C, MacKellar, F L and Lutz, W (2001) Population and Climate Change. Cambridge University Press: Cambridge.

Examination of Witnesses

DR NEIL ADGER, School of Environmental Sciences and Tyndall Centre for Climate Change Research, University of East Anglia, and DR KATRINA BROWN, School of Development Studies and Tyndall Centre for Climate Change Research, University of East Anglia, examined.

Chairman

60. Good morning. Perhaps you could start by telling us a little bit about the Tyndall Centre: what is the Tyndall Centre, who are you and what do you do, just to put it into context.

(*Dr Adger*) I am Neil Adger from the University of East Anglia. The headquarters of the Tyndall Centre for Climate Change Research is at the University of East Anglia. The Tyndall Centre is a consortium of nine UK institutions, universities and research institutes, and we have been funded by the Research Councils through the OST for five years initially with an aim to explore sustainable solutions for the climate change problem. We have a research programme on adaptation to climate change, on decarbonisation—how we tackle the causes of climate change—and other programmes on coastal zones and integrated assessment issues. Both myself and Dr Brown are from the University of East Anglia but we call on a wide consortium of UK scientists and UK expertise.

61. To what extent is adaptation a risk management strategy?

(*Dr Adger*) It is ultimately a risk management strategy but perhaps it is worth trying to draw a distinction between how perhaps we as individuals manage the risks associated with climate change and what the role of other agencies is. I am sure this is what your Committee is particularly interested in, the role of governments in promoting adaption. People adapt to change in climate all the time. Climate is changing now, but has changed over the millennia, so we are always undertaking spontaneous or autonomous adaptation to climate change. You could say that the whole of the history of agriculture is just adaption to the environment in which it finds itself. Individuals have always adapted to climate change. On the other hand, therefore role of government is to look at planned adaptation, to anticipate what climate change is going to do and to plan for it in the future. A simple example would be, if your house is at risk from being flooded then you take out insurance and that is your autonomousadaptation to climate change. What can the Government do about it? It can change building codes and make sure that we do not build houses in the flood plain. That action is what we would call planned adaptation. Equally the Government can intervene in insurance markets and make sure that people who are vulnerable can get access to insurance. Ultimately everything about adaptation is risk management. The distinction really is between short term and reactive adaptation that we may undertake ourselves or that farmers in Africa may undertake, such as planting new crops every year, compared to long term adaptation which is, as we heard from the previous evidence, taking this longer term view. These two aspects of adaption are something slightly different.

62. Perhaps we can just go to Tony Worthington's question to the earlier witnesses. On the work that you have done, and I am thinking particularly of the work in Vietnam, what policy changes do you think there might need to be either in DFID or in UK Government policies or in policies in developing countries?

(*Dr Adger*) The first thing that DFID need to do is to make sure that their policies and their investments overseas do not actually undermine the capacity to adapt. As I have said, people adapt spontaneously to climate change and to climate variability all the time. But there is always the risk that investments in transport, investments in coastal infrastructure, or investments in urbanisation and in industrialisation might undermine people's ability to adapt. The first thing we have to do is to make sure that what DFID invest in does not undermine people's ability to adapt and obviously does not increase the whole climate change problem by increasing emissions to the atmosphere contributing to causing climate change in the first place. Investments and interventions need to have—and obviously these are DFID's stated objectives—significant links with what we would call sustainable development.

(*Dr Brown*) There are many things that aid agencies such as DFID can do, at many different scales or levels of intervention. Obviously there is the international scale where DFID has an important role in advising and supporting things like the international research initiatives under, for example, the CGIAR system and putting pressure on institutions such as the Global Environment Facility to make sure that climate change is mainstreamed as a development issue, and to support those kinds of processes. There is also national level intervention in supporting some of the strategies and again in supporting governments in developing countries to mainstream climate change, and also in supporting the kind of integration that happens at national level through some of these adaptation plans and other national level strategies. Obviously the local level and direct development interventions are key as well which very often focus at project level. As Dr Adger has said, primarily of importance is making sure that those interventions are not exacerbating the problems, are not enhancing local level vulnerability, are not undermining people's ability to cope with the kinds of changes that might be induced by climate change. We have been working on DFID-funded research in the Caribbean which is looking at how we can increase participation by local people in coastal zone management, for example. This work has both direct and indirect benefits in terms of responding to climate change. It helps people to manage their natural resource base in a more sustainable way, so it has a direct benefit, but also it indirectly supports local institutions and social capital at a local level which is one of the things that really enhances social resilience in the long term. There are many different scales of intervention therefore but what I do think is important is the poverty elimination focus. I think

[**Chairman** *Cont*]

that vulnerability is not the same as poverty and we cannot necessarily say that it is always the poorest who are the most vulnerable. There is a very strong relationship there and a lot of the research, for example on social vulnerability in Vietnam, shows that, but it also demonstrates that there are different sorts of social institutions and different kinds of mechanisms which operate and which are not just about the poorest people being the most vulnerable. There are people who have particular types of livelihoods which make them more vulnerable to some of the impacts of climate change. There are people for example in urban situations who might not be the poorest of the poor but might be particularly vulnerable to things like heat stress. People on small islands might not be the poorest but are especially vulnerable. There is a special need for us to consider that and for DFID to remember that poverty does not necessarily equal vulnerability and so it has to think carefully and perhaps target interventions for climate change.

Mr Battle

63. Could you just amplify, so that I have a clearer picture in my mind of practical examples of effort, projects that could make things worse? I should not say it but even in this country we are still building on flood plains and then mopping out the basement months if not years later. We do not always get it right, but what kinds of projects or approaches could exacerbate the problem, as you put it? If you could give us a few examples it would be clearer to know what to avoid.

(*Dr Adger*) I will not talk about a direct example of development intervention, but rather elaborate, as the Chairman asked, specifically about the example of Vietnam and policies that can make things worse. The situation there, as I observed it in the mid to late 1990s, was in a way a rolling back of the state and a move towards a market oriented state away from central planning. There were lots of benefits to that liberalisation. Many of the people in the coastal areas where I was studying, were becoming richer, they had more opportunities to be involved in agriculture and other livelihood strategies. In one sense they were becoming more resilient, they had more resources to help them to cope with the typhoons which hit the coast of Vietnam all the time but which are likely to increase, certainly in intensity, in the future because of climate change. They were enhancing their social resilience and thus their capacity to adapt to climate change. At the same time, however, the Government, in de-centralising, threw away much of its system of monitoring for storms, its whole centralised system that it had built up over 20 or 30 years of planning. This system was very labour intensive, not relying on sophisticated technology, but which gave people early warning of typhoons and also maintained and built up the coastal defences each year. In de-centralising, and in rolling back government, they exacerbated the vulnerability of those people living on the coast. On the one hand, then local people were becoming richer individually and were perhaps able to cope better. But on the other hand policies that were being implemented at a national level were exacerbating the risks for people living on the coast. There are also examples of all sorts of resettlement projects, moving people to hazardous areas, that potentially exacerbate their vulnerability to climate change in many situations around the world.

64. Deliberately moving people to hazardous areas?

(*Dr Adger*) No, inadvertently moving people into the path of hazards. Certainly in Vietnam and in a number of other countries in South East Asia government sponsored resettlement projects, for example to reclaim land on the coast, or to move people into upland frontier regions where there are malaria risks and so on, do not take account of these particular impacts and particular vulnerabilities that are built into natural systems. So they can be maladaptive and exacerbate people's vulnerability to climate change.

65. In a sense, if there is a hurricane and it is a few days of an event, put it that way, there is resilience built in if it is not that regular. People now live in volcanic areas and after a volcano erupts they still go back, whether it is in Japan or in Goma. What about moving away where the climate change could be a more long term factor, say, a drying out of an area, encouraging people to move entirely away from that area, or do they move themselves and realise that that is the way to adapt? What role does migration play?

(*Dr Brown*) I believe that migration in the past, in the present and in the future will be one aspect of a critical adaptation strategy. It has been I think a spontaneous adaptation strategy, not only long term migration, but also short term migration, seasonal migration, is a feature, particularly of people who live in marginal and risky environments. Short term migration and the ability to utilise different agro-ecological zones, for example, are a survival strategy for pastoralists in many semi-arid areas. Migration is a really critical strategy. Of course, the more permanent and perhaps international migration is one of the most important issues in the long term in adapting to impacts of climate change. We undertook this study which looked at the possible impacts of climate change on the British overseas territories and in looking at the kinds of strategies that people employed on small islands, it is very much a feature of life on small islands, for example, in the Pacific, that people have moved around islands over time because of various environmental changes and other hazards. It is likely to become increasingly important, and of course for some small islands—we heard about the Maldives in the last session—they might not be able to move back. It might be a permanent state of affairs. What we have to do is to try and look at the positive aspects of migration rather than primarily seeing that in a very negative light. We need to look at how governments and different agencies can support those migration strategies. We have been involved in other work, for example, looking at migration strategies to the frontier in Brazil and Amazonia. That is the sort of situation where government has been encouraging migration into these areas, partly because it is the escape valve for pressures in other places, but then

[**Mr Battle** *Cont*]

when migrants get there they are not offered any support, so they are seen as undertaking very environmentally degrading practices and as having very risky livelihoods because there are not the support mechanisms, although they can build them up quickly with a bit of help.

Ann Clwyd

66. I came to your very interesting centre some years ago. I can remember walking round a field holding some oxen, not very expertly; I think Ian was there at the time. I cannot remember what the project was now. Is the project still going on? If not, why not? Secondly, what sort of dialogue do you have with the Vietnamese Government? What sort of notice do they take of your findings, or do they just carry on regardless?

(*Dr Brown*) The University of East Anglia had what we called a Rural Technology Unit which was an experimental farm which undertook quite a lot of work looking at low impact agriculture. It has changed quite a lot over the years. The oxen went and were replaced by donkeys and then by sheep over the years, and then it concentrated much more on work on irrigation and cropping. We still have an interest in all of those areas and are still actively engaged certainly with DFID's natural resources research programmes, but it has changed.

Chairman

67. And the relationship to the Government of Vietnam?

(*Dr Adger*) We have a direct memoranda of understanding between the University of East Anglia and institutes in Vietnam, and links at government level. We have published our work in Vietnamese which is important for disseminating widely. Typically this is the sort of work that DFID can fund and go the extra mile with. My own was not funded in this case but DFID, I know from experience, provide funds to translate work for policy-makers into local languages. The Vietnamese Government are faced with all sorts of pressures and with a plethora of information coming to them. Moving towards a market liberalisation strategy has all sorts of risks associated with it, all sorts of environmental risks and environmental change, and all sorts of other pressures, such as demographic change. You were talking earlier in the session about the role of DFID investing particularly in reproductive health. Some of our research in Vietnam and elsewhere shows that not only are reproductive health issues important to demographic transitions but there are other demographic changes, particularly migration, particularly ageing, which are equally important when it comes to climate change. As Dr. Brown pointed out earlier, when you have ageing urban populations, for example, those are the people who are likely to be affected by increased heat stress. When you have labour market liberalisation, as we had in Vietnam, you suddenly find people increasingly moving all over the country. The challenge is to make sure that when people move to the highlands of Vietnam they do not start to degrade the environment there. Or when they move into coastal areas that they do not cut down all coastal mangroves and move into shrimp agriculture because there is now a large market for shrimp to Korea and Japan and it is a globalised market. Because if such things occur suddenly the coast becomes much more vulnerable to the impact of coastal storms. The government of Vietnam needs to take account of this myriad of potential environment impacts of globalisation, migration and demographic change and the impacts of strategies that they have undertaken. Our research group is just one small player in that process. Those are significant sustainable development challenges, particularly in the light of climate change.

Tony Worthington

68. Apart from the last couple of responses the overwhelming imagery I have had from these sessions has been about the countryside and the coasts and agriculture, and yet one of the biggest changes of recent years, absolutely staggering changes, has been about the growth of mega cities. This was referred to earlier as an adaptation, that people went to the cities to escape the climate change and many other factors in the rural areas. That does not mean they do not continue to contribute to climate change. I was just wondering whether there had been any research done on the sustainable development of huge cities. That is a very vague way of putting it, but when you see these huge shanty towns growing up around already large cities you can see that some pretty intense thinking needs to go on here to make these manageable. Where is that done? Can you help us?

(*Dr Adger*) You have identified a critical issue. We picked up on it slightly when we said that the demographic transition in many developing countries is going to lead to rapid urbanisation. A very significant number of the mega-cities of the world are in coastal regions. In fact, the work of Professor Nicholls whom you heard from earlier has identified specifically this issue, that, because of their footprint on their local environment, and because of climate change particularly associated with sea level rise, the populations within those cities are likely to be very vulnerable. In cities like Bangkok, for example, their use of groundwater is causing subsidence of the whole city relative to sea level, and a relatively small change in sea level is going to have very significant impacts in terms of flooding on Bangkok and its local environs. Climate change is not something you can escape by moving from rural to urban areas and there are key climate change impacts that are important for cities. As you say, of urbanisation also tends to go hand in hand with industrialisation and the contribution of greenhouse gases from these mega-cities is obviously very significant as it is where industry is concentrated. On the other hand, there are opportunities to build the

[Tony Worthington *Cont*]
infrastructure for sustainable transport and other sustainable strategies for cities, all the things we have difficulty with in this country.

Mr Khabra

69. Has the impact of climate change set a vulnerability pattern or does it change from year to year, area to area?

(*Dr Adger*) There is an adage which is, The climate is what you expect but the weather is what you get. Climate itself in terms of those mean trends in temperature that you would expect at particular seasons is likely to change on a gradual basis over the coming century and has been changing over the past century and a half because of human intervention in the climate system. The rate of it will depend largely on the fact that we are committed to some change in the future but the absolute rate during the incoming century is dependent on the rate of greenhouse gas emissions to the atmosphere. Within overall trend there is variability year on year. That is what people have to cope with, particularly those people whose livelihoods are dependent on weather-related resources, people involved in fishing, and in agriculture in particular, or in those industries where water is a significant input. There has always been variability year on year. But what the science tells us is that globally we are going to trend upwards in terms of temperature and that within that trend we are likely to see greater variability. This greater variability in particular sectors and particular regions is really the key parameter we have to adapt to. It is, I believe, of course the phenomenon that we least understand.

70. Has any study been done to establish how much is caused by natural causes?

(*Dr Adger*) This is an ongoing area of debate but the vast majority of scientists from every corner of the world agree that the trends in temperature that we have seen over the past hundred years the other changes in climate and our projections for the future are primarily associated with our own actions putting greenhouse gases into the atmosphere. And historically those countries that industrialised first have to date made by far the greatest contribution so far to this problem.

Chairman

71. National Action Plans for Adaptation—good news? Do they work? Are they being involved? Comments?

(*Dr Brown*) We do not know yet because we have not seen many of them. One the one hand we have now these three pilot plans that have been developed and I am sure that Dr Huq will tell you a little bit more about that in the next session, but there are obviously potential benefits from national level planning and a national level consideration of adaptation and mainstreaming adaptation within government processes. Of course potentially they are costly in terms of human resources, in terms of time. They are an important first step in terms of mainstreaming and integrating across different government departments. One of the main considerations which we have discussed is really how these plans can be flexible, whether or not they are going to be rigid blueprints, how they can enhance flexibility and particularly whether or not they will consider the spontaneous adaptation strategies which we talked about earlier or will they just focus on the planned adaptation, on anticipatory measures? Is there then potential that these actions will undermine the kind of spontaneous adaptation strategies which we observe in many areas and particularly amongst marginal communities? One of the other considerations is the danger that they might lead to blanket generalisations of intent and large scale solutions to these problems. Obviously in terms of then trying to inform things like health planning, agricultural and crop research, strategies, transport strategies, they can only be a good thing.

72. Finally, what kinds of institutions are needed to facilitate adaptation? How will they work at national and local levels and how might they link to international institutions and policies?

(*Dr Adger*) These national adaptation plans that you have just referred to are being promoted under the Adaptation Fund set up under the Climate Change Convention agreed at Marrakech just a few months ago. The major responsibility for these has been given to the Global Environment Facility who have been involved in this area for a decade. Internationally much of the co-ordination is going on through the Global Environment Facility. DFID have some influence over the Global Environment Facility and we would certainly urge DFID to exercise themselves to take an active role in this whole planning process I think that if we have business as usual and ongoing, GEF replenishment climate change will simply get wrapped up with all the other development assistance that the GEF get involved in, and with all those of the World Bank as the GEF's host institution. There are some specific adaption needs that we have highlighted: the need for understanding adaptation processes, the need to consider migration, for example, as a potentially sustainable adaptation strategy locally and even internationally. Perhaps these proposed national plans would not consider these issues. Hence international co-ordination and international thinking needs to continue on these large-scale issues. The GEF has the primary responsibility internationally. Bilateral donor agencies and national governments are the primary players in terms of planning adaptation for the future.

Chris McCafferty

73. That sounds fantastic but is it not putting the cart before the horse? Earlier we heard that there is a great need for impact studies and that they are not being funded and are not taking place. Would it not be better to put the money into the impact studies first and then look at National Action Plans following that information being generated, or can the two things run concurrently?

(*Dr Brown*) I think we have to have both. They do need to run concurrently because they will inform each other. We need more sensitive information on specific vulnerable hot-spots. We need to know about what the likely impacts on those places are and we need to know about the nature of vulnerability

[**Chris McCafferty** *Cont*]
there, and we need to know about what coping strategies exist already and how they can be enhanced through interventions on these different scales. I want to add that in a way what we are seeing now, especially post-Marrakech, is a whole range of different mechanisms and institutions being set up, most of which are not going to come on stream until 2005. Even then National Action Plans are likely to be prerequisites for even the least developed countries getting access to those special funds. The problems are already with us, however, and we have to find ways of understanding what institutions already exist within countries that support and enhance the kind of adaptation strategies which we can observe by looking at responses to past climatic and other extreme events. That will help our understanding for the present and for the near term future as well as for the long term future.

74. So you would agree it is really important for impact studies to be funded in order for the rest of the work to take off and be beneficial?

(*Dr Brown*) But concurrently with adaption.

75. Yes, but the previous evidence was that impact studies are not being done.

(*Dr Adger*) Certainly, but I do not think these impact studies are necessarily a prerequisite for looking at adaptation. Just to reiterate what Dr Brown has said, people are adapting to climate change now. The climate has been changing over the past hundred years. If we look at rainfall records in the Sahel, for example, there have been significant changes over the past 30 or 40 years. Understanding how people are coping with that climatic change now, in some cases very successfully coping with that climatic change, will give us great insight into all those other potential problems that we face in semi-arid areas around the world. Understanding how people are coping in the Pacific with the expectation of climate change is going to be very important. We had a question earlier on about the role of expectations. There are countries in the Pacific that are already planning for moving all their population to other countries. But once they plan for it and once that becomes the expectation then there is obviously no incentive to invest in those countries. International funds are not going to go towards them, so people will leave all the quicker. Adaptation is happening now and I believe there is an urgent need for DFID to facilitate and plan for it as well as facilitating some understanding of it.

Chairman: Thank you very much for the evidence you have given us. It has been very helpful. Thank you also for introducing us to the knowledge that there is a Rural Technology Centre at your university. I am not quite sure what happened to Ms Clwyd's oxen but I think this is a centre that some of us might like to visit on some future occasion. It sounds like some very interesting work is being done.

Supplementary memorandum submitted by the Tyndall Centre for Climate Change Research

1. *One of the Committee members (Chris McCafferty) suggested that addressing adaptation before we have a better understanding of climate change impacts is "putting the cart before the horse".*

Many communities are highly vulnerable to current climate variability. Adaptive measures designed to decrease vulnerability to events such as droughts, floods and storms will help reduce the societal impacts of future change. Given the large uncertainties associated with climate prediction, building people's capacity to cope with change in a flexible manner is a more realistic strategy than attempting to prepare for specific predicted impacts. Future climate change depends not only on the physical characteristics of the climate system, but also on our own choices concerning development and energy use, neither of which can be predicted with anything approaching certainty. A "bottom up" capacity building approach is therefore much more appropriate than a "top down" impacts-led approach in addressing vulnerability.

It is relatively straightforward to assess current vulnerability to climate extremes at the national level, using data concerning natural disasters and their impacts. Such an assessment is currently underway at the Tyndall Centre. More detailed assessments at the sub-national level are planned, and these will help to target adaptation and development funds at the most vulnerable groups.

2. *One issue that was highlighted by the discussions was that global food production is likely to decrease over the course of the twenty first century. It is tempting to draw the conclusion that the way to tackle this issue is via novel agricultural practices and "new crops".*

Agriculture can be adapted without the development of new crops, and without large-scale government-led schemes to increase productivity at the national level. In parts of African people have managed to maintain agricultural productivity in the face of decreasing rainfall and large increases in population. This has been achieved through more integrated systems of crop and livestock management, a shift away from cash crops for export to food crops for local consumption, soil conservation and tree planting activities, and a shift from artificial fertilisers to animal manure. Income diversification, seasonal migration and the exploitation of local markets have all also played an important role in increasing food security. These factors have enabled people to adapt to climate change that has already occurred, over the last few decades, and have contributed to sustainable land management and food production. People should be assisted in these kinds of activities—education based on indigenous experience, and funding through micro-credit schemes, can give people the freedom they need to adapt, and enable them to create sustainable systems that can cope with climatic deterioration.

3. *The question was raised as to how DFID should change its existing policies, given that its main aim is poverty reduction.*

As far as climate change and sustainable development are concerned, DFID should pursue the following two strategies, both of which will reduce poverty.

i. Existing and planned projects should be examined in order to assess how their objectives might be affected by climate change. Will the projects be viable if the areas concerned experience the kinds of multi-year climatic variations they have experienced in the past? How will a change in the frequency of extreme events affect the project outcomes? Do modelling studies suggest that climate in these areas is particularly sensitive to global change? What climatic assumptions have been made at the planning stage?

ii. Climate change will exacerbate poverty in some areas, and may create poverty where it has not existed before (see original written evidence from the Tyndall Centre). Assessments of vulnerability that identify particularly vulnerable "hot-spots" will enable action to be taken that can pre-empt the effects of climate change, through capacity building programmes that increase people's economic and food security options in these areas.

4. *Population was raised by the committee members as a major issue*

While access to family planning is a key issue in tackling poverty, it is not seen as key to tackling climate change. While some vulnerable areas, notably coastal regions, are highly populated, many highly vulnerable groups exist in areas of low population density (eg much of Africa, which is sparsely populated for the most part). High population densities are often the result of migration to cities due to rural poverty. Supporting small-scale rural sustainable agriculture based on food crops rather than export crops will help mitigate this problem. Furthermore, the population that can be supported by a region is a function of how that region is managed—there is no absolute carrying capacity. The committee were concerned that population growth would exacerbate climate change. At present the vast majority of greenhouse gases are emitted by the richest nations. Technology transfer via the Clean Development Mechanism, to help developing nations move to cleaner energy sources, will go a long way towards addressing concerns that industrialisation in the developing world will undermine mitigation effors; this will do much more to minimise future climate change than will a concentration purely on population control.

Tyndall Centre for Climate Change Research

February 2002

Memorandum submitted by Dr Benito Müller, Oxford Institute for Energy Studies (OIES)

There is a strong consensus within the policy analysis community and beyond that developing countries will play a key role in determining the success of the multilateral climate change regime under the UN Framework Convention on Climate Change (FCCC). It is equally widely understood that, as a consequence, success will not be forthcoming if the key concerns of developing countries—in particular those pertaining to inequities—are not adequately taken into account in the future development of the regime.

The Problem: There is a surprisingly rigid North-South divide in the perception of what constitutes the paramount climate change equity problem. In the Northern hemisphere, where the relevant discussion is primarily led by non-government stakeholders (academic, NGO), it is regarded to be the issue of allocating emission mitigation targets;[27] in the South, the concern—backed by many governments—is above all about the discrepancy between the responsibility for, and the sharing of climate impact burdens.[28]

The Causes: One of the root causes of this Divide is a fundamental difference in the perception of climate change itself. In the industrialised North there is a widely held "ecological view" of the problem. Climate change is perceived as a problem of polluting the environment, of degrading the eco-system. As such, it's essence is seen to be that of a wrongful act against "Nature." Accordingly, environmental effectiveness—the capacity to "make good" the human-inflicted harm on Nature—becomes a key criterion in assessments of climate change measures. The chief victim from this perspective is Nature, mankind's role is primarily that of culprit. And while climate impacts on human welfare are regarded as potentially life-style-threatening, they are taken to be self-inflicted and hence largely "deserved." Environmental integrity ("to do justice to Nature"), is the overriding moral objective. Issues of distributive justice are only of concern insofar as they could become obstacles in the pursuit of this paramount objective.[29]

---

[27] For a potential compromise between *Per Capita* and *Grandfathering* (*Status quo*) allocations see, for example, Ulrich Bartsch and Benito Müller, *Fossil Fuels in a Changing Climate*, Oxford: OUP 2000.

[28] A study currently undertaken at the OIES about the perception of these key climate change equity concerns has revealed a significant North-South Divide. A review of COP7 media reports and ministerial statements provided significant positive evidence that (i) the most pressing inequity issue for developing country stakeholders is having to bear climate impact burdens disproportionate with causal responsibilities, and (ii) their view that this issue has hitherto largely been ignored. A subsequent look at recent academic climate equity literature lent support to this view. Indeed it indicated that while "equity" is often being put on the agenda by developing country experts, the scope of the agenda itself—namely emission mitigation– was firmly set by the industrialised world.

The reality in the South is quite different: climate change has primarily come to be seen as a human welfare problem—not least because of the assessment work carried out by the Intergovernmental Panel on Climate Change (IPCC). The harm is against humans, it is largely other-inflicted, and it is not life-*style*-, but *life*-threatening. In short, the chief victim of climate change is not "Nature", but people and the paramount inequity is one between human victims and human culprits. Climate change is a development problem, no doubt! But for the developing world it is *not* a problem of sustainable development—in the technical sense of "living within one's environmental means"—it is a problem of *un*sustainable development, in the non-technical sense of failing to survive.

The Lessons: While lessons are bound to differ between the stakeholders involved—governments, non-governmental and intergovernmental organisations (NGOs, IGOs), academic institutions—the one overarching lesson must be to take heed of the programmatic demand made by India at the COP7 high-level segment (particularly if one believes the scope of the current regime to be too narrow):

> "The efforts so far have been focussed on mitigation. In the coming decades, adaptation needs to be given much greater attention. The next decade, Mr. President, therefore should see concrete implementation of existing mitigation commitments and active consideration and action on adaptation to the adverse impacts of climate change."

At the *policy decision-making* level—the level of national governments—the inevitable impacts and their differentiated causal responsibilities must be fully acknowledged and taken into account in the multilateral negotiations under the Framework Convention (FCCC). In other words, while the mitigation regime established under the Kyoto Protocol will inevitably require some negotiation about architectural extensions (eg second commitment period targets), the issue of sharing climate impact burdens must be given centre stage, in particular because of the fact that while mitigation burdens are still a matter of decision, many of the impact burdens are not.

To enable this change of negotiating focus, the immediate lesson at the level of *policy analysis* must be to put much greater effort into thinking of innovative ways in which these impact burdens could be distributed. The fact is that—apart from the controversial monetizations of economic cost-benefit analysis (themselves fraught with intrinsic equity problems)—we seem to have little if any idea how such burdens—say, that of the 25 million refugees expected by Bangladesh alone—could actually be "shared", let alone be shared in an equitable manner.

To sum up, for many developing countries climate change is not an environmental problem, and it is not a question of whether economic development can be sustained without harming Nature, it is a simple issue of survival. As such, it must be positioned firmly at the centre of any overseas development agenda.

Dr Benito Müller
Oxford Institute for Energy Studies (OIES)

January 2002

Memorandum submitted by the International Institute for Environment and Development (IIED)

ABOUT IIED'S CLIMATE CHANGE PROGRAMME

1. The overall goal of the programme is *to enhance understanding of the linkages between sustainable development and climate change*. The objectives of the programmes are to:

- Improve *the understanding of climate change impacts* for poor developing countries including both policy makers and poor groups.
- Improve the *decision making capacities* in vulnerable developing countries to cope with impacts of climate change.
- Improve the *negotiating capacities* of poor developing countries in the climate change negotiations through analysis of issues relevant to them.
- Improve the *sustainable livelihoods opportunities of poor communities* in developing countries in light of possible climate change impacts.

2. The *focus and approach* of the programme is:

- To work in *collaboration* with partner organisations and individuals in developing countries.

---

[29] An equitable allocation of emission targets is primarily considered to be a problem because it is seen to be a *sine qua non* for an expansion of the mitigation regime to developing countries. Allocations which would result in surplus permits are rejected because they are perceived to be conflicting with the paramount objective of environmental integrity.

- To work in partnership with collaborating institutions and individuals in the developed countries for *advocacy* on behalf of the poor communities in developing countries.
- To ensure that *lessons learned* from research and analysis are transmitted effectively *to policy makers* in developing as well as developed countries.
- To *mainstream climate change* concerns into national strategies and policies in relevant sectors.
- To ensure both south-south and north-south flows of relevant *information.*

3. The *priority themes* of the programme are:
- Enhancing adaptation capacity in developing countries.
- Climate Change and sustainable livelihoods linkages in developing countries.
- Capacity strengthening in developing countries.
- Information dissemination (on both mitigation as well as adaptation).
- Equity in relation to developing country emission targets.
- Enhancing opportunities for developing countries to take advantage of opportunities offered for Carbon Trading (including *CDM).*

RESPONSE TO SELECT COMMITTEE INQUIRY ON THE FOLLOWING (SELECTED POINTS ONLY):

4. *The potential impact of global climate change on development and developing countries, and especially on poor people in those countries with particular reference to the benefits and adverse effects of global climate change and how these can be harnessed or mitigated. This will include the extent to which developing countries and particularly the poor in developing countries are more susceptible to the adverse effects of climate change and less able to adapt to any benefits:* According the third assessment report of the Intergovernmental Panel on Climate Change (IPCC) published in 2001 many of the developing countries in Africa , Asia and Latin America and small island states including some of the poorest countries of the developing world are the most vulnerable to the adverse impacts of climate change. Thus for these countries the impacts of climate change will likely be to set back their efforts at development for several decades (if action to adapt or cope with climate change is not incorporated into their development planning and strategies from now). IIED has been working with its local partners in many of those countries to ensure that national level activities in response to international environmental agreements (including climate change as well as others) are responded to in a such a manner as to make sense from the sustainable development perspective of the developing country itself. Measures need to be taken to strengthen the (already stretched) capacity of institutions and civil society in those countries to adapt to climate change (in keeping with national sustainable development strategies) as well as support their efforts to develop along a sustainable path. The capacities for enhancing the resilience of such countries include information, infrastructure as well as appropriate investments.

5. *The extent to which developing countries will be disproportionately affected by climate change and the extent to which it will increase disparities between developed and developing countries:* Given that the poorest countries of the world are growing poorer relative to the richest already even without factoring in the impacts of climate change it stands to reason that the adverse impacts of climate change on the poorest countries will increase such disparities as well. However unlike under the normal international aid regime the possibility of international fund flows under a climate change regime could possibly benefit some of the poorest countries (at least those with relatively high populations) if the international targets for greenhouse gas emissions for the developing countries were to be allocated on the basis of per-capita entitlements to the global atmosphere. This will depend largely on the ability of those countries to negotiate effectively in the international negations leading up to the second commitment period (after 2008).The UK government can assist those countries to enhance their negotiating capacity in order to help them play a significant part in the international negotiations.

6. *The extent to which climate change will affect the likelihood of conflict:* In many parts of the world a traditional coping strategy for poor communities has been to migrate, either seasonally or for longer periods. Sometimes these are within different parts of a single country (eg much of the migration to urban areas in developing countries) as well as across international borders (eg for large populations in the Sahel and Caribbean islands). The number of people migrating (both within countries as well as across international borders) due to environmental factors is increasing rapidly. It is more than likely that climate change impacts will exacerbate this trend leading to greater pressure for poor and vulnerable communities to migrate to cities or across international borders.

7. *Potential pathways for environmentally sustainable development:* IIED's work over many years on assisting countries to develop national sustainable development strategies and learn from that experiences has demonstrated the importance of incorporating national development strategies with all the other external environmental threats, specially climate change (for those countries most at risk). The UK government can encourage and assist developing countries to ensure that their national strategies for sustainable development (nssds) incorporate climate change issues and actions.

8. *The nature of uncertainty in climate change forecasts, and the extent to which such uncertainty impedes policy formulation at present:* Although the issue of enhancing the level of uncertainty in the climate forecasts (specially to make them more reliable at regional and national levels)—the existing model results are sufficient to proceed to focus work on the study (and enhancing of) adaptive capacity in the most vulnerable developing countries. Thus the need now is not so much to enhance the capabilities of the models but to use the existing model results for countries to prepare plans for both mitigation as well as adaptation to climate change. It is also important for the developing countries to be able to carry out such modelling themselves (or at least have access to regionally located centres where such capacity exists).

9. *Measures for monitoring the adverse impacts of climate change, including present vulnerability and adaptive capacity:* Measurement and monitoring of vulnerability and adaptation is of great importance for the developing countries in particular. IIED's own work on measurement of vulnerability and adaptation is focusing on methodologies (including information, analysis, use of multi-stakeholder groups, etc) which are easy and robust enough for local institutions and communities to apply for themselves in the developing countries as they will be the ones most affected and in need of being able to measure and monitor impacts.

10. *Identification of countries or vulnerable situations that are a priority for adaptation:* The United Nations Framework Convention on Climate Change (UNFCCC) has prioritised the Least Developed Countries (LDCs) and the Small Island Developing States (SIDS) as being the most vulnerable to the adverse impacts of climate change and also amongst the least capable to cope with these impacts. IIED's work with these countries has focused on finding ways to develop adaptation strategies which are compatible with national sustainable development goals and strategies and which build on existing national and local resilience and capacities both in the governments as well as in civil society in those countries. The island states have been relatively effective in the international negations by forming the Association of Small Island States (AOSIS) early on and using international development assistance to engage expertise from the Foundation for International Environmental Law and Development (FIELD) in London, UK. The LDCs have been relatively slow to organise themselves in the climate change negotiations (they are relatively more active in the WTO negotiations). However they have recently become more active and IIED has been working closely with them, specially on the issue of adaptation to climate change which is of primary importance to them.

11. *The presence or absence of national or local coping strategies potential linkages and synergies (or conflicts) between adaptation to climate change and other international conventions and planning processes, eg, desertification, poverty reduction. The likely effects on patterns of rural/urban migration:* The developing countries have often been asked to prepare separate stand-alone national studies for the different multi-lateral environmental agreements (MEAs) (including climate change) which have been done in parallel and to satisfy needs of the international community (eg each MEA secretariat has its own format for national communications) and has resulted in such national plans of action being of little practical value in the country. This is also recognised by the countries themselves and they are keen to establish methodologies (in which IIED is also assisting some of them) to ensure the integration of the MEAs not only amongst themselves but more importantly into the national level sustainable development planning or goals. The UK government can assist the developing countries to ensure that the MEAS are not only well integrated with one another but more importantly are integrated into their own national sustainable development strategies.

12. *Progress in developing countries with implementing the millennium development goals and the international development target on environmental sustainability and regeneration, and the effect that these countries' policies for Sustainable Development will have on the environment and global climate change with particular reference to National Strategies for Sustainable Development (NSSD):* The National Strategies for Sustainable Development (NSSDs) which countries are promise bound to initiate or prepare by 2002 are a useful instrument to incorporate issues related to climate change as a long term development issue. Unfortunately up to now most countries (both developed as well as developing) have tended to ignore the climate change issue when preparing their NSSDs. There is therefore much scope for the developing countries to incorporate climate change issues into their NSSDS as they are revised leading up to the World Summit on Sustainable Development (WSSD) to be held in September 2002 in Johannesburg, South Africa.

13. *The impact on the very poorest people in developing countries:* Climate change impacts, as with many other impacts of environmental degradation tend to have a disproportionate impact on poorer communities, both because they tend to rely on the natural resource base more and also because of their relative lack of capacity to cope with any negative impacts. Thus any attempts to enhance the capacity of the poorer communities to deal with adverse consequences of climatic events (eg droughts, floods, hurricanes, etc) will also have a beneficial effect of strengthening their adaptive capacity to any future climate change.

14. *Population growth and its effect on the environment in developing countries; urban and rural environmental problems:* One of the major problems facing most developing countries (particularly in South Asia) is the rapid migration of rural populations into urban centres both from push factors (including environmental degradation in rural areas) as well as pull factors (eg jobs). The impacts of climate change are likely to enhance the environmental degradation of the natural resource base in many parts of the developing world leading to enhanced pressures for migration from rural to urban centres.

15. *The need for capacity and institution-building to support sustainable development and manage natural resources in the face of global climate change:* Developing countries need help to develop their own strategies with respect to national development planning (including environmental issues such as climate change) so that they are able to pro-actively address issues of concern to them as opposed to merely reacting to and reflecting the perceived priorities from international agreements and funders. This requires the identification and strengthening of such institutions (both governmental as well as non-governmental) which have such potential and to strengthen their capacities through appropriate support-both technical as well as financial). The UK government can help the developing countries most effectively by assisting them to build their own capacity to carry out the analysis and planning based on their own priorities rather than in response to international donor fashions.

16. *The need to build sustainable communities and to integrate social, economic and environmental dimensions of development:* IIED's work over many years (certainly since the Rio Summit) has been focused on integrating the different sectors including environmental, economic and social into a truly integrated sustainable development pathway of action. This is not easy even in developed countries, let alone in developing countries, nevertheless there has been a wealth of experience on which to build over the years so that a multi-sectoral, sustainable development pathway can be evolved including both governmental as well as non-governmental actors. The UK government can assist developing countries to integrate social, environmental and economic concerns into their own development planning based on their own national priorities with genuine stakeholder participation.

17. *The role of civil society groups, the private sector, local and central government:* Civil society groups including the non-governmental sectors, local government, private sector, as well as local communities by themselves. It has worked with numerous such groups around the world in a variety of settings and on different issues. These are some of the highest potential building blocks for assisting the vulnerable developing countries to enhance their own resilience in the face of a global challenge such as climate change. The UK government can assist developing countries to enable all the different sectors of civil society to engage in the national planning process to ensure that national plans and strategies are truly nationally owned.

18. *The extent to which the links between poverty and the environment are included in Poverty Reduction Strategy Papers (PRSP) and the degree to which PRSPs and NSSDs take account of each other:* In most developing countries the preparation of NSSDs or PRSPS have been in response to external (donor) pressure and very few of them have been either nationally owned or able to integrate different issues (specially environmental issues)into the national plans or strategies. However there is nevertheless a great opportunity (which the UK government can assist) to incorporate both environmental as well as climate change issues along with poverty alleviation into both PRSPs as well as NSSDS in future-specially in the lead up to the WSSD.

19. *The degree to which appropriate policies on environmental management can improve health, employment opportunities, livelihoods and tackle poverty:* Policies on environmental management can play a very progressive role in directing investments into specific desired sectors (eg into clean technology)and in a manner that is beneficial to the environment as well as poverty alleviation. However most developing countries (particularly the poorest and most vulnerable to climate change) lack the capacity to develop (let alone enforce) such policies. The UK government can assist countries to take a livelihoods approach to developing policies and making sure that they are both pro-environment and pro-poor.

20. *The potential offered by donor programmes (both multilateral or bilateral) and international mechanisms for achieving sustainable development, mitigating environmental degradation and lowering greenhouse gas emissions in developing countries; with particular reference to:* Given that most of the poorest developing countries (who are also amongst the most vulnerable to climate change) are extremely dependent on the major multi-lateral and bilateral funding agencies it is important that the development funding agencies themselves first realise that they need to take into account climate change impacts to inform their own funding priorities and then help the vulnerable countries to enable them to cope with the adverse impacts (as well as take advantage of any opportunities).

21. *Potential rules for adaptation funding, whether at the international level (eg, UNFCCC, GEF) or bilateral programmes (of which Canada and the Netherlands have taken a lead):* The current status of adaptation funding is primarily through the Global Environment Facility (GEF) which disburses adaptation funding through a three stage process (Stage I being for studies and planning only, Stage II for planning and capacity building and Stage III for further capacity building as well as actual implementation of adaptation measures).This is a rather cumbersome process (and indeed only a very few activities under Stage II have been funded and none under Stage III yet). There is certainly a role for all the interested funding agencies (both bilateral as well as multilateral) to get together to develop guidelines which are simple and straight forward for the most vulnerable developing countries to access funding easily to carry out work on adaptation to climate change. These issues are being addressed through the Climate Change and LDC Funds created by the sixth Conference of Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). IIED, together with others has been playing a role in assisting the interested development funding agencies to keep abreast of each other's work and coordinate amongst themselves to the extent

possible. However there is definitely a role (e.g. for DFID) to be pro-active in trying to ensure coordination and maximum sharing of knowledge gained in carrying out adaptation work in developing countries in future.

22. *Mitigation policy and the usefulness and success (or failure) of present pilot schemes (such as Joint Implementation or carbon trading):* The Clean Development Mechanism (CDM) which is the vehicle for Carbon trading through mitigation where developing countries can get some benefits of project investments has been seen by many as a means of both transferring clean technology to the developing world as well as stimulating private sector investments. However with the United States of America not agreeing to participate in the Kyoto Protocol the market for such projects is diminished considerably. Nevertheless they offer some potential to stimulate some transfer of technology and resources from the developed to the developing countries. IIED has been working on the issue of how market mechanisms can be used to deliver sustainable development benefits (including Carbon benefits) and believes that there is definitely potential if done properly. Although CDM is seen as primarily a vehicle for private sector investments, nevertheless there is a role for official development assistance, specially for the poorer developing countries who are unlikely to attract any such private investment flows unless they are helped to build the capacity to do so.

23. *The role of international fora and meetings (such as the Commission for Sustainable Development, the Global Compact, Rio + 10, the Earth Summit) and the extent to which they reflect development concerns:* The World Summit on Sustainable Development (WSSD) to be held in Johannesburg, South Africa, in September 2002, (and its preparatory committee meetings) definitely offer a vehicle for looking again at the inter-linkages between the climate change issue and sustainable development (which exists in the original convention language but have been neglected for so long).The recent COP7 statement on WSSD is a step in the right direction and offers an opportunity to make the UNFCCC process take sustainable development concerns into account more overtly than in the past. The recent decision of the Inter-governmental Panel on Climate Change (IPCC) to reject the proposal to prepare a Technical Report on Climate Change and Sustainable Development is, however, to be deplored. IIED along with partners from developing countries is planning to hold a major workshop on the issue of climate change and sustainable development at the ministerial prep-com of WSSD to be held in Indonesia in May 2002.

24. *The need for private investment that is both environmentally sustainable and links with the wider aim of poverty elimination; with particular reference to: The extent to which aid and investment are focussed to deliver both growth and sustainable development:* The Clean Development Mechanism (CDM) of the Kyoto Protocol has an explicit goal of promoting sustainable development as one of its two major objectives (the other being the reduction of greenhouse gas emissions). This offers a way to ensure that investments made under CDM are indeed supporting and contributing towards sustainable development. However the UNFCCC decision gives the responsibility for ensuring the sustainable development objective to the host (ie developing country) and most developing countries have not yet done anything on this issue(or simply lack the capacity to do so). There is therefore a clear role for development assistance to assist (the poorer) developing countries to enable them to develop sustainable development criteria for CDM projects and also to help them to develop CDM feasibility studies for themselves. Other wise there is a real danger that left to the market alone (and CDM is primarily a market mechanism) only a handful of the larger developing countries (such as China, India, Brazil and South Africa) will attract the bulk of CDM projects while the vast majority of the poorer developing countries will not get any. IIED has been helping portfolio funding agencies for CDM projects (such as the Prototype Carbon Fund of the World Bank) to develop sustainable development criteria of their own for CDM projects in which they invest. IIED believes that sustainable development criteria should be developed promptly and be made part of each CDM project feasibility and monitoring protocol.

25. *The impact of a developing countries environmental policies on investment by the private sector:* Many of the developing countries (specially the poorer ones) are reluctant to impose environmental conditions on private sector investments (specially foreign direct investors) for fear of losing such inward flows of investments. However there is a growing realisation amongst many of those countries (often initiated by civil society groups) to ensure that environmental protection should go hand in hand with investments (specially industrial development). The international private sector has a major role to play in also ensuring that any investments made are environmentally and socially sound. IIED has been working with major international corporate sector companies in several fields (eg mining, paper and pulp, tourism, etc) to help them to ensure that their investments in developing countries is done in a manner that is both environmentally and socially sound. Given that the private sector is likely to be the major source of foreign investments in the developing countries in the coming decades (far outstripping official development assistance) it is important to engage with the international corporate sector to ensure that such investments are environmentally and socially sound.

26. *DFID's policies, strategies and programmes on environmental sustainability and especially global climate change; with particular reference to DFID's Strategy Paper "Achieving Sustainability: poverty elimination and the environment"; Its usefulness, implementation and success:* DFID's Strategy Paper makes reference to the support to be provided to the most vulnerable countries to climate change. This indeed a good priority but it must be made more concrete in terms of exactly how such support may be provided. In order for DFID to carry out this task properly it must first develop its own capacity to assess and develop strategies with respect

to climate change and development assistance and then be able to prove such support to the developing countries themselves. This will enable DFID to become a major player in the role of making sure that climate change impacts for the most vulnerable countries is minimized and any opportunities presented are indeed taken up.

CONCLUSIONS

27. The main conclusion of our submission is to reiterate IIED's view that integrating climate change issues with national sustainable development planning and strategies is of utmost importance to most developing countries (but specially so for the most vulnerable and poorest developing countries). Hence dealing with climate change issues should be an integral part of those countries' sustainable development planning and activities (and by implication for the development assistance agencies such as DFID to help those countries to build that capacity).

Dr Saleemul Huq
International Institute for Environment and Development (IIED)

January 2002

Examination of Witnesses

DR BENITO MÜLLER, Senior Research Fellow, Oxford Institute for Energy Studies, and DR SALEEMUL HUQ, Director, Climate Change Programme, International Institute for Environment and Development, examined.

Chairman

76. Good morning, gentlemen. Thank you for the very full written submissions. The questions that we want to ask you today are in the sense of further and better particulars from those submissions. Dr Huq, you argue that helping to build the adaptive capacity of communities for dealing with extreme events should have a beneficial effect for strengthening adaptive capacity for future climate change. Often the measures to deal with extreme events in communities are based around developing early warning systems, building flood defences or providing life saving measures like cyclone shelters. How does this help address longer term vulnerability or is the point more to do with building the necessary institutions and capacity that can address both extreme climate events and longer term climate changes?

(*Dr Huq*) I think we need to do both. If you look at the history of dealing with particularly extreme climate events and the rehabilitation work that goes on afterwards they tend to concentrate on just reproducing the status quo before the event as it were—rebuilding the houses, the roads, whatever infrastructure was damaged, without giving a lot of thought to preventing or coping with such events in future. Part of the work that needs to go into coping with extreme climatic related hazards has to be in building the capacity to cope with them in future which includes both early warning as well as institutional capacities at many levels—national levels of relief agencies or hazard warning agencies as well as in local communities for them to be able to cope with it. There have been examples of this in my country, for example, Bangladesh, where we had a major cyclone which killed over 100,000 people, you may recall, in 1991. Since then there have been a lot of efforts at improving early warning systems and building cyclone shelters. We had a similar sized cyclone in 1997 which only killed about 30 or 40 people. I would ascribe that in large part to people being much better prepared for the event that occurred at that time.

77. In your memorandum you argue for strengthening the capacity of institutions and civil society to adapt to climate change. What kinds of measures need to be taken at local, national and regional levels, what support should donors like DFID play and which donor agencies have demonstrated significant leadership?

(*Dr Huq*) If I can give you another example from my country, Bangladesh, with respect to floods, we had, as you may recall, in 1987 and 1998 two very big floods which caused a lot of damage and loss of life, after which the entire donor community got together and tried to invest in developing flood protection for Bangladesh. There was this major activity called the Flood Action Plan which at that time I and my institution based in Bangladesh had opposed because we did not feel that that was necessarily the right way to go. It was simply an engineering driven vision of trying to dam up the country and prevent these floods from occurring. Our argument was that first of all that was not a feasible option; secondly, even if it was technically feasible it was not commercially feasible: there was not the money to do it; and thirdly, it was much better to invest in much softer options, such as improving the early warning systems, improving communities' abilities to deal with floods. Again these things were done and a major flood which occurred in 1998 did not cause as much damage as had been expected because people and communities had been empowered. DFID has been a major contributor to this softer option approach which many of the other international agencies like the World Bank have not supported. They have taken a much more engineering approach to the question.

78. You argue in your paper for there to be an allocation of emission targets on a per capita basis, but is it not right that by 2015 emissions from developing countries are likely to exceed those from

[**Chairman** *Cont*]

the developed world? Therefore is there not a danger that developing countries could become complacent about emissions?

(*Dr Huq*) I will let my colleague answer the question in more detail but I will just make one point there. Even if the developing country emissions become much larger, as they are predicted to do in the next few decades, if you calculate those on a per capita basis for countries like China and India they are going to be orders of magnitude smaller than those for the West, and particularly for countries like Bangladesh, which has very low emissions to start with and a very high population right now, our per capita emissions are almost zero in comparison to the rest of the world.

(*Dr Müller*) I have to say that I am not an expert on impacts but I have worked on the international regime which has focused so far on mitigation mainly. With regard to this issue of the second commitment period targets, and these of course are on the table, I think one has quite clearly to say that allocating these permits, these targets, for countries is a matter of allocating a common asset. It is establishing property rights for something and there are different ways of doing it. You can do grandfathering, you can just say, "We have them already", or you can say, "No, there are no property rights involved; we all have equal rights to it". It is not a matter of responsibility in all these things. If you want to make policy decisions about who ought to do what and when then you really have to look at per capita emissions, not at country groupings. If you start comparing country groupings then Switzerland, for example, would never have to do anything at all because the rest of the world emits always more. If you want policy decisions, who has to start with something? It is like wealth comparison. If your policy depends on the richer starting to do something you do not do it in absolute terms. It would be ridiculous to say that Switzerland does not have to do anything because they have 50 times less GDP than the US. In order to look at these allocations of assigned amounts you have to look at per capita emissions. There of course all of the developing countries are still much less culpable than we are.

Mr Robathan

79. Taking the per capita emissions basis and the fact that people in developing countries are less culpable than the rest of us, that is all very well but that does not actually affect the global warming as a whole.

(*Dr Müller*) It does, with respect.

80. Hold on. If you say, "Of course we want to get it done but the people of Bangladesh (or India or China) have much less in the way of emissions per person than anywhere else and therefore we should be more equitable on this", if their emissions go up the impact will be disastrous for us all, including those whose emissions are not very large. What I really want to say is that I understand where you are coming from but is this not slightly an irrelevance?

(*Dr Müller*) First of all the facts are that China, which is the second largest emitter after the US, actually managed to reverse its emission trend in 1996 and is now eight per cent below its 1996 emissions, the only country in the world apart from—

81. How?

(*Dr Müller*) Market. They liberalised coal mines and all these sorts of things. There is an article which I can gladly give you which explains it all very well but it has happened.[3] The second thing is that this argument that they will nullify our efforts in a sense—

82. That was not my argument. I said we will all suffer.

(*Dr Müller*) This has been put forward. The point is then that our efforts are just not good enough. If you look at responsibility and if you think that action has to be in proportion to one's responsibility, if their responsibility is still much less than ours then we just have to do more.

83. I suspect you might not disagree with this, but I would suggest to you that we have made our mistakes (and are still making them) in the developed world, for want of a better term, and some would say mistakes were made a hundred years ago and more, but we now have advancing technology where we could assist the developing world not to make the same mistakes we made, and in particular I am thinking of renewable energy.

(*Dr Müller*) Yes, absolutely.

84. My question for you is, if we agree on that, should not a lot more of our development be going towards assisting the development of renewable energy which would benefit all those people in the developing countries?

(*Dr Müller*) The point is that this has very little to do with the assigned amounts. We can do that anyway. I quite agree.

85. I think the assigned amounts seem to be slightly a red herring.

(*Dr Müller*) Not really, no. Senegal has about 30 kilograms of carbon per head, the US has five tonnes. There is not a lot you can reduce with a CDM project in Senegal. These surplus permits which they will get would enable them to invest the money they get from selling them back to us in these technologies and do things which they otherwise could not do. They cannot sell CDM permits because they have no CDM capacity but with these surplus permits they can get these things going. That is why per capita allocation is not going to be very expensive for us either. We did calculations but it is a matter of not doing it via charity but via allocation of assets.

86. So it is not a cop-out from the developed world?

(*Dr Müller*) No, I do not think so. We will still have to do a lot.

Mr Khabra

87. I do disagree with my colleague because I agree with Dr Huq's views on this allocation of emission targets on a per capita basis for a country like India or Bangladesh. They have got practical difficulties of planning and small business and small

---

[3] *Science* Vol 294, 2001.

[**Mr Khabra** *Cont*]
industry. The country is not yet fully equipped with the kinds of rules and regulations they need. It is difficult for a developing country, and a fast developing country like India, when the biggest culprit at the moment is America which is not prepared to accept any international agreements at all. I think there is scope for countries like India and Bangladesh not to accept these international targets which the highly industrialised countries want to impose on them.

(*Dr Huq*) If I could add one point to that, the position of most of the developing countries, certainly my own, is that we are not opposed to action. Developing countries need to take action as well. You are quite right, we need to take a much more clean development path for the future, particularly in the energy sector, than the industrialised countries have done, and we are all prepared to do that. In the negotiations it is just that it is a question of who goes first. The Annex 1 countries have to go first and they have made certain commitments which we want to see them stick to and then with regard to future commitments developing countries will certainly come on board. This question of allocation is something that has to be worked out and there is a matter of principle involved in this as well. Who does the atmosphere belong to?

Chairman

88. Migration has been seen as an important coping strategy. Is migration a viable coping strategy and what do you see as the risks of increased environmental refugees and further conflict as a consequence of that?

(*Dr Huq*) My response to that would be the following. I think that environmental migration is already a major source of whatever migration we are seeing both within countries as well as internationally. There are large population movements from rural to urban. Much of that can be ascribed to environmental degradation in many countries and across borders as well. Climate change will simply exacerbate that, particularly in countries like Bangladesh where a one metre sea level rise, for instance, would wipe out a fifth of the country and more than a fifth of the population. Where are they going to go? There simply is not space in the country for them to go. Already a lot of Bangladeshis migrate to India. There is a lot of illegal immigration across the border into India which causes problems between our two countries. This will only be exacerbated. At an international level this needs to be recognised and some sort of regime for more equitable and better organised migration of people should be made available to countries such as these. In the case of climate change it is different from other environmental degradation in that it can be ascribed to actions that are taking place in other parts of the world. As you say, the United States is the biggest emitter and if certain things are happening because of climate change then there is a degree of responsibility for these people now which may not have been the case in the past when cyclones and so on were regarded as acts of God.

89. We have got a cluster of things. We have got environment plans, we have got national strategies for sustainable development, we have got poverty reduction strategies. We have got strategies coming out of our ears. Are they sufficiently well co-ordinated and what should be done to ensure they are fully and properly co-ordinated?

(*Dr Huq*) Unfortunately they are not, and I think that there is a growing realisation that they are not and they need to be. I would say that there are two levels of this question. One is that there is a proliferation of the multilateral environmental agreements. There is climate change, there is biodiversity, there is desertification and so on which produce their own international bureaucracy and requirements and countries have to respond by developing a biodiversity plans or a climate change plans and so on. These need to be better integrated at a global level but then at a country level again this tends to separate out the little capacity that there is into responding to international requirements rather than addressing national needs and trying to integrate them at a national level. I certainly feel that the approach of integrating climate action plans or the adaptation plans that are now being discussed, international sustainable development strategies, or whatever shape they might be,—some countries call them Agenda 21, some countries call them national plans—but whatever a country has in place as its national strategic thinking it needs to incorporate these climate change strategies as well as the adaptation plans. It is much more important than just doing another stand-alone plan which will be left on the shelf or brought to international meetings but not have any relevance for the country.

90. Dr Müller, we have read your work and your proposals about a global compromise set of quotas whereby each country gets an allocation somewhere between their present use and a per capita entitlement. How could developing countries play a more significant part in international agreements and negotiations on climate change? What are the most significant barriers to them doing so?

(*Dr Müller*) It is a very good question. I will give you an example. There are I would say not more than 15 people from developing countries who I meet regularly at every single conference. Saleemul is one; there are a couple of others. They represent the developing world policy analysis community. One always meets the same people. One good friend of mine from Senegal once said that he could actually live on a first-class airline ticket the whole of the year but he could not afford a research assistant. He gets money to go to all these conferences and be the token developing country representative but at home for someone to help him to do the work he cannot get money. This is a very concrete, very simple example of what in particular DFID could do to help these NGOs, these analysts, these groupings, to do their work. There is now a Dutch consortium which is sponsoring a programme where a researcher from Senegal and one from Bangladesh are going to come for six weeks to Oxford and we are going to do work together. These sorts of things are extremely important because ultimately the policy and policy analysis has to be home grown. We all know that we trust other people but we trust our own people the most. This capacity to analyse these things is largely not

[**Chairman** *Cont*]

existent. Another thing which I did find is that I engaged in a little project about the perception of climate change in different regions and there is a very strong divide north/south on what climate change is all about. In the north, quite correctly, it is seen to be a pollution problem. Like we had with industrial pollution, it is a matter of emissions and all that, quite rightly so. We are richer and less vulnerable, so vulnerability does not come into the picture that much for us, but we have to cope with the emissions. If you read the DFID memorandum they say, quite rightly, that sustainable development is no longer a matter of just environmental protection but they identify climate change as an environment matter. For developing countries climate change is a matter of disaster management and a matter of survival. It is not a matter of pollution prevention primarily. I am talking about the main focus. In our study we looked at all the ministerial statements at Marrakech, which no-one ever reads, and it was very interesting reading to see that again we have a complete north/south divide. The map was almost like the Commonwealth, where impacts are mentioned and where they are not. In the north there is no mention of them. Europe is a little bit of a mixed bag. They did mention developing country impacts in their ministerial statements which we have to remember are three minutes so you have to be rather concise. The point is that we have to get away from thinking that climate change is purely a matter of a mitigation regime. I was very pleased to see that the witnesses here, apart from me, were all involved in adaptation and impacts. That is very rare. The international regime up to now has almost exclusively been about mitigation. We need to turn away and tell development agencies that they are involved in this. This is a main theme. Climate change needs to be mainstream in development policy, not the other way round. It is not environmental protection; it is human impacts which count in the developing world.

Mr Walter

91. I was rather alarmed by Dr Müller's description of these 15 first-class season ticket holders who were carrying out research in the developing world which does tend to indicate that they are doing it somewhat in a vacuum. The question I have, and perhaps you would comment, is whether or not these people have the ear of their own governments, of the agencies in their own regions, if they cannot even get enough money for a research assistant.

(*Dr Müller*) I think Saleemul will ultimately be better placed to answer this. I know for example that some African countries have recently abolished their environment ministry. The one important point is that one reason why impacts have been neglected in the international regime is because there was no sufficient voice there, not just in the NGO community. Take delegations at Bonn, COPS 5 I think. The US was there with 120 official delegates. India, which is one of the biggest countries, had seven. Some countries have one. If you remember that these negotiations can go on for three days without interruptions, you can imagine what this one guy from Senegal was doing. He was basically just sleeping. This is capacity building at ground level, why things which are important to developing countries are not brought on to the table.

(*Dr Huq*) At a country level, and I have been involved in trying to do this in Bangladesh for some time, quite a few of the developing countries have over time been able to build a certain level of capacity doing work on climate change—vulnerability analysis, impact analysis, a lot of the time in collaboration with institutes abroad such as in the UK. There is a certain level of capacity that has grown I think which can be built on, and I would suggest that that is something that DFID might want to look at in terms of building from an existing level of capacity. With respect to the question of getting the Government's attention, I must admit that that has been relatively rare. Except for the island countries like the Maldives, who have really taken up this issue at a very high level within their governments, most of the other developing countries—and I cite Bangladesh as an example which is obviously one of the most vulnerable—it is very difficult to get high level policy makers and politicians to accept climate change as a particularly pressing problem in the light of all the other problems that they have. They see it very much as longer term, It will happen in a hundred years. What can we do about it? It is difficult for them to grasp the immediacy of what they can do in the short term. I think that is something again where DFID might help those within the country who are trying to do this. There are people even within government, within the environment agencies, who are aware of this problem but who are not heard at the higher levels of policy making.

92. What you are suggesting is that they are paying lip service to it.

(*Dr Huq*) They do the best they can with whatever resources they do have, but they have very limited resources.

Mr Robathan

93. You said that too much development aid tends to be mitigating what is happening as a result of climate change. This is really my question because we of course are involved with the development aid policy of this country. Going back to what I was saying before, do you think we should re-focus on development aid, not away from the concentration on poverty, which I think we would all accept, but on to the longer term effects that by concentrating, for instance, on renewable energy the benefits that that would have both to the immediate population which was served by the energy and able to bring itself out of poverty, but also into what the people who are most vulnerable to climate change, such as the fifth of the population of Bangladesh who would be displaced by a metre rise in sea level? Do you think our environmental aid is focused too much on Band Aids?

(*Dr Müller*) Probably. The one thing I have to say is that I am not an expert on the UK development policy but I give you an example where no-one knows what to do precisely with these refugees or displaced people as they are called. We have no clue of how to share this responsibility with anyone, let alone share

[**Mr Robathan** *Cont*]

it equitably. We have to start producing much more imaginative policies in that respect. I see your point about renewable energies. Energy is important for everyone; that is just standard of living. Renewable energies are all the better because they do not pollute, but the one thing which we have to look at is climate change as a disaster. I am not too sure how a meteorite catastrophe in the UK would be handled but I am sure there are lots of agencies involved, including the Army and all that. If we look at our own preparedness and plans this is the sort of thing, adapted to developing countries, which we have to look at—disaster management. It is not just a matter of getting a proper energy system going and not polluting because there we are again getting into the pollution prevention game. There are lots of studies about that, the penetration of renewables and how it will help, but where there is very little is about how we react to the disasters, the climate impacts.

(*Dr Huq*) One of the things we need to distinguish between when we are talking about sustainable development and the question that you raised of tackling poverty first, is that that is obviously the primary target but it tends to be seen in terms of the shorter term. What climate change enables one to do, and I have found this very useful in arguing with people in development, is that it re-focuses attention on the "sustainable" part of the sustainable development if you like. Too many people in development see the short term development part of the picture, which is overwhelming and obviously can draw all your resources, without looking at the sustainability angle at all. If you look at it through a climate change lens, because it is a long term problem, it is not going to happen in the immediate future, it enables you to take a longer term perspective on all the different aspects of development, including the energy path that we are going to take, including disaster management, including population growth, so all the longer term problems can be incorporated into taking a climate change perspective on development which brings it back to the sustainable development paradigm rather than the immediate development paradigm which many people are locked into, both national governments and aid agencies.

Tony Worthington

94. I have the same point as Andrew. It is a very simple issue as far as DFID is concerned. It now has a legal duty to develop all its concerns to lowering poverty; that is what it is about, and we are supposed to judge it as to whether it is doing that. In addition to all the problems that poor people have got, they have also got this thing called climate change. What is DFID to do about that? We have been to Bangladesh and seen the amazing ability of the Bangladeshi farmers and the adaptability to get drowned and then get up and get going again, but what are you going to do about Dhaka?

(*Dr Huq*) Dhaka is a big problem.

Tony Worthington: A lot of people live in Dhaka.

(*Dr Huq*) A lot of people live in Dhaka and it is getting a lot more vulnerable with time. The solution to the urbanisation problem in Bangladesh in particular has to be to try and draw resources out of Dhaka to other urban centres. Unless we are able to do that we just cannot support the rapid growth of Dhaka that is going on right now and another dozen urban conurbations around the country. The good thing about Bangladesh is that it is geographically small and communications are relatively easy so people can move around. If there were resources being put into other urban centres in terms of industry and other infrastructure then I think that people, instead of migrating to Dhaka, would migrate to other cities as well. Migration to cities is in my view unstoppable. The push and pull factors are so strong that preventing it is almost impossible. The good story is that on the population growth front Bangladesh has actually made quite substantial achievements in bringing down the rate of population growth even though it is a very poor country.

95. But if you were saying to DFID, "Look: we recognise what you have done in Bangladesh, but for the future your emphasis should change to this", what would that be?

(*Dr Huq*) I do not think it would be too great a change in emphasis. What I would say, as I said earlier, is that the issue of climate change is something that happens at a global level. It is something that the country and the development practitioners in the country are not really cognisant of enough. They do not really know what they may be doing which may exacerbate the problem, as we heard earlier from Dr Neil Adger. That needs to be brought in. Bringing in that dimension of climate change as a global problem that will affect Bangladesh, and everybody knows that Bangladesh is one of the most vulnerable countries, beyond that fact of how that will play out and what we need to do about it is something that has not sunk into the development practitioners and policy makers in the country and even within DFID. I have had a tough time arguing to DFID that they should be taking this seriously.

96. But you are not saying to them what they should do.

(*Dr Huq*) Two things need to be done. One is that all the development agencies need to re-examine their own development aid in the long term, to look at its long term impacts. Just to give you an example in the past, they have been funding roads all over the country. These roads have not always been done in the best environmentally planned manner. We are hydrologically a very flat country. In many places they have screwed up the hydrology of the place by not having enough bridges and culverts in them, which has exacerbated the flood problem. Similarly, other long term infrastructure investments may have detrimental effects without taking the long term consequences into account. The issue of looking at climate change impacts and particularly the adaptation options in planning are like insurance. It is like doing an environmental impact assessment which is the norm in any big project. You just add on a climate impact assessment to that. It is not changing things drastically. It is just re-thinking them in the light of these potential problems that are likely to occur to a larger extent in Bangladesh perhaps more than in many other countries.

Chairman

97. Do you think there is sufficiently well co-ordinated UK Government policy on climate change with DEFRA taking the lead generally on climate change negotiations but with DFID really seeking to help promote effective negotiations by developing countries on adaptation and poverty reduction? Do you have any observations to make about the way in which the UK Government approaches climate change policy?

(*Dr Huq*) From what I have seen I think that the UK Government is probably one of the better governments in terms of having good co-ordination amongst the agencies, amongst the people that I have met at the negotiations. Having said that, however, I have had difficulty in getting DFID to take on board the issue of climate change as a development problem—and not just DFID but development agencies in general with whom I talk regularly, such as the World Bank and various other bilaterals. It is difficult for people involved in development in the short term, looking at crises, to see what the relevance is of climate change—what is it they can do? I do not have ready answers for that. All I am saying to them is that it is something that they should be taking seriously and thinking through and seeing whether it is of importance to them and, if so, how and what do they need to do about it. That is something that DFID really needs to take on. It has not done so yet sufficiently in my opinion.

Chairman: Thank you very much for two very interesting papers and also for giving evidence today. It is much appreciated. I have to say that I think I have been unlucky. Whenever I have been to Dhaka there always seems to be *hartal* between various groups and politicians and all their supporters. I do not think I have ever been in Dhaka without there being a *hartal* somewhere.

(*Dr Huq*) It is good for pollution because there are no crowds on the streets!

TUESDAY 12 FEBRUARY 2002

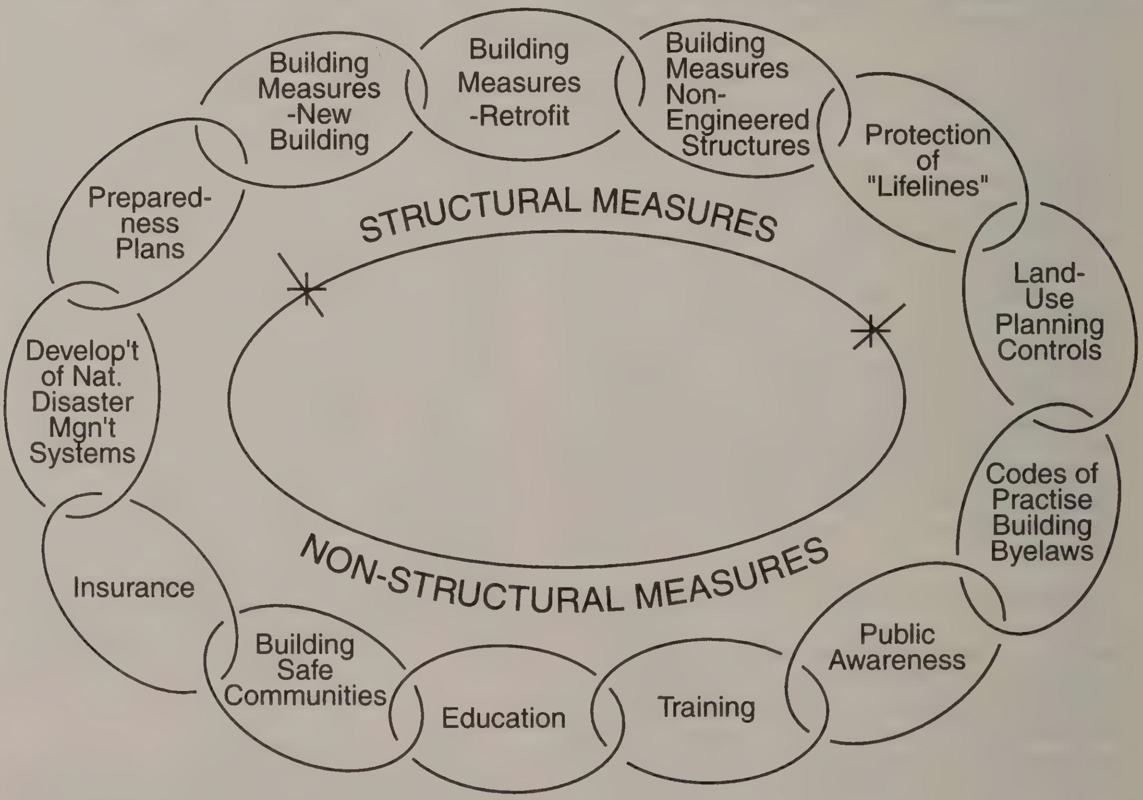
Members present:

Mr Tony Baldry, in the Chair

Mr John Battle	Chris McCafferty
Hugh Bayley	Mr Andrew Robathan
Ann Clwyd	Mr Robert Walter
Mr Tony Colman	Tony Worthington
Mr Piara Khabra	

Memorandum submitted by Professor Ian Davis, Cranfield Disaster Management Centre

1. *Observations on Disaster Preparedness and Mitigation Strategies*



Building Measures -New Building
Building Measures -Retrofit
Building Measures Non-Engineered Structures
Protection of "Lifelines"
Land-Use Planning Controls
Codes of Practise Building Byelaws
Public Awareness
Training
Education
Building Safe Communities
Insurance
Develop't of Nat. Disaster Mgn't Systems
Prepared-ness Plans
STRUCTURAL MEASURES
NON-STRUCTURAL MEASURES

Figure 1

THE RISK REDUCTION CHAIN

Firstly, I would value the opportunity to briefly discuss with the committee the broad focus of National Disaster Risk Reduction Strategies, as these must develop in coming years to cope with the expanding threats from disasters. The "Chain Model" provides a useful representation as a basis for discussion concerning some difficult questions:

What can "we" in the UK Disaster Community (ie DFID/ DEFRA/ NGO's / Academic Researchers, Trainers and Educators / Private Sector / Advisory Committee on Natural Disaster Reduction) do to actively support:

- full integration and coordination of the disparate elements in this "risk reduction chain" or is this an unrealistic quest given the scale and complexity of such a task?
- creative ways for developing countries to effectively synchronise poverty reduction and risk reduction strategies;

- developing countries, as they seek to decide which of the elements in "protection chain" should be given priority attention?
- the development of relevant and realistic links between national disaster risk reduction strategies, or systems and the better established and *much* better funded national disaster response structures or systems;
- capacity building within developing countries to reduce their vulnerability to extreme natural hazards;
- radical improvements and the urgent expansion of in risk assessment methodologies to underpin the development of risk reduction measures. Particular attention needs to be devoted to the development of Vulnerability Assessments: (Social/Physical/Economic and Environmental). In addition work is needed to develop "Loss Estimation" to enable societies to be able to calculate potential losses in order to justify the costs of mitigation.

2. *Evidence concerning the progressive development of sustainable "National Safety Cultures"*

Secondly, I would value the opportunity to develop the Risk Reduction emphasis further by discussing the development of sustainable National Safety Cultures on the lines of the following model:

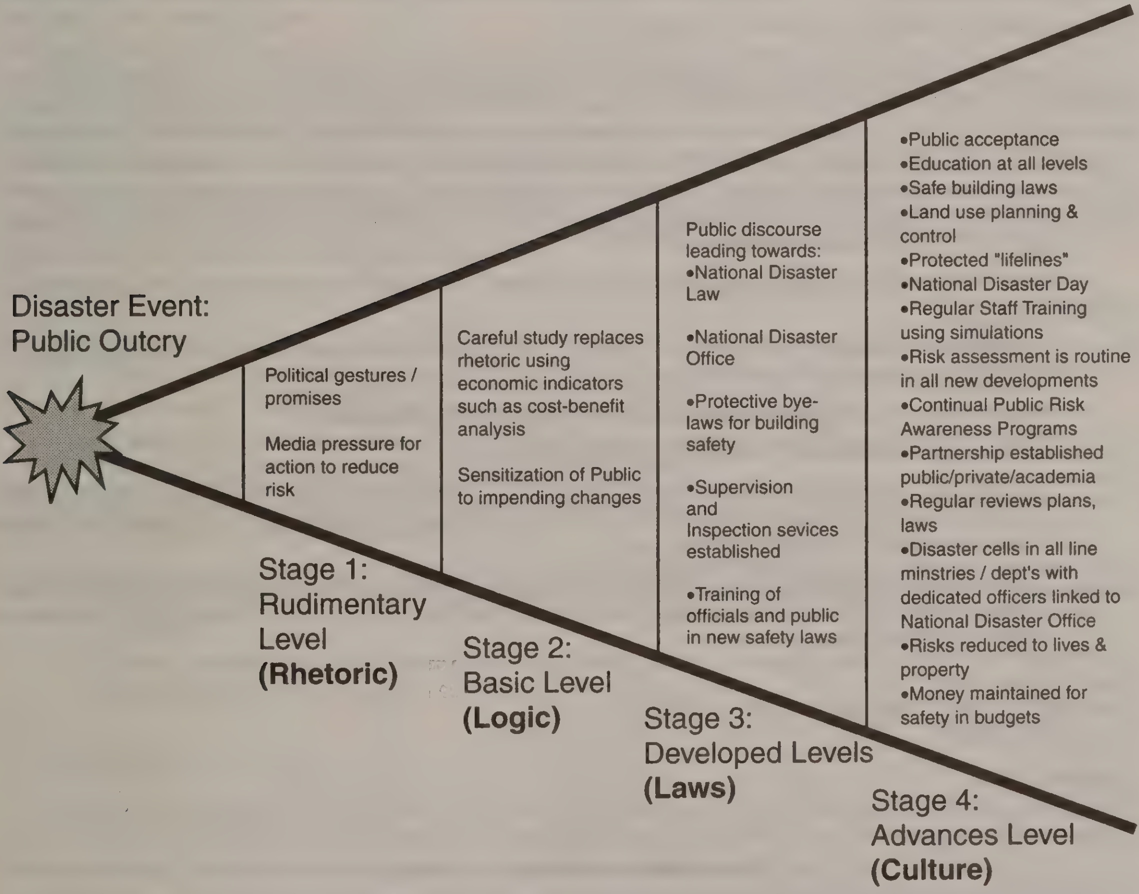

Disaster Event:
Public Outcry
Political gestures / promises
Media pressure for action to reduce risk
Careful study replaces rhetoric using economic indicators such as cost-benefit analysis
Sensitization of Public to impending changes
Public discourse leading towards:
•National Disaster Law
•National Disaster Office
•Protective bye-laws for building safety
•Supervision and Inspection sevices established
•Training of officials and public in new safety laws
•Public acceptance
•Education at all levels
•Safe building laws
•Land use planning & control
•Protected "lifelines"
•National Disaster Day
•Regular Staff Training using simulations
•Risk assessment is routine in all new developments
•Continual Public Risk Awareness Programs
•Partnership established public/private/academia
•Regular reviews plans, laws
•Disaster cells in all line minstries / dept's with dedicated officers linked to National Disaster Office
•Risks reduced to lives & property
•Money maintained for safety in budgets
Stage 1: Rudimentary Level (Rhetoric)
Stage 2: Basic Level (Logic)
Stage 3: Developed Levels (Laws)
Stage 4: Advances Level (Culture)

Figure 2

THE STAGES IN THE DEVELOPMENT OF A SAFETY CULTURE

Four stages can be identified on the diagram above:

- Stage 1 Rudimentary Level
  (*where risk reduction is still at the level of Political Rhetoric*)
- Stage 2 Basic Level
  (*where risk reduction is still at the level of Logical Argument*)
- Stage 3 Developed Level
  (*where risk reduction has been codified in Laws and Codes*)

- Stage 4 Advanced Level

  (*where an overall, well-integrated Seismic Safety Culture is in place*).

What can the UK Disaster Community, as noted above, do to actively support:

- highly disaster-prone countries to move from "rudimentary levels" of risk reduction in the direction of more advanced levels?
- the development of "Human Resource Development" (HRD) as critical elements in sustainable structures, strategies and systems to reduce risks;
- creative, and sustainable partnerships between public and private sectors, perhaps on the lines of the US development of "safe communities" in FEMA's "Project Impact", the innovative public links to insurance companies by using the incentives of reduced insurance premia to create safer conditions;
- far better ways to absorb, or diffuse disaster risk reduction so that it is not isolated from all line ministries and everyday life;
- the political process as a key element in the creation and maintenance of public safety.

Recommendations for the Committee to consider:

1. That the "Advisory Committee on Natural Disaster Reduction" is charged with the creation of an inter-disciplinary, multi-hazard and multi-sectoral "task force". This would be asked to work in a creative partnership with DFID staff to develop a series of benchmarks and performance targets for the development of workable and realistic National Risk Reduction Strategies and Systems. The aim would be to develop strategies for risk reduction that support and interact with poverty reduction initiatives. This work would then need to be developed in close consultation with relevant UN Agencies in order to be applied by disaster-prone countries with the active support of DFID.

2. That DFID provide a clearly defined and well resourced National Focal Point in the Risk Reduction field, in order to:

- enable more focused, and better coordinated work to be undertaken by the broad community of UK groups working in this field;
- assist in productive dialogue between these groups and government;
- link to the broadening UN commitment in this field;
- provide an easy access point for disaster risk reduction officials within developing countries to gain access to UK based resources in NGO's, Private Sector and in Universities. (This would link to the work of all DFID regional offices); and
- provide a technical link for DFID staff in their regional offices, as well as geographical desks, to gain useful risk reduction information and human resources to assist them in advising country officials in their respective areas.

Professor Ian Davis
Cranfield Disaster Management Centre (CDMC)
Cranfield University

February 2002

Memorandum submitted by Tearfund

EXECUTIVE SUMMARY:

Tearfund welcomes the opportunity to submit evidence to the International Development Committee's enquiry on climate change and sustainable development.

Section 1: *Introduction to Tearfund*

Section 2: *The adverse effects of global climate change—extreme weather events*

As a relief and development organisation we are particularly concerned about the link between global climate change and the increasing number and ferocity of extreme weather events, and the implications such events have for sustainable development. The IPCC predicts that the incidence of floods and droughts will increase with intensified global warming. These disasters affect life, health and livelihoods and in so doing set back development by decades.

Section 3: *The extent to which the poor are susceptible to the adverse effects of climate change*

The poor are the most susceptible to the adverse effects of climate change in the form of extreme weather events; they frequently live on marginal, vulnerable land which lacks the infrastructure needed to cope with the impact of floods and droughts. They are also generally less well informed and prepared for disasters, and their livelihoods are often destroyed with the land. Thus disasters both expose and widen the gap between rich and poor.

Section 4: *How the adverse effects of global climate change can be mitigated*

Disaster mitigation and preparedness (DMP) programmes prove effective in reducing the vulnerability of the poor to disasters.

Section 5: *Funding adaptation to global climate change has a substantial role in mitigating its adverse effects*

DMP remains a low priority in national and international funding policy. However, the cost of investing in DMP compared to the cost of post-disaster recovery is low.

Section 6: *The presence or absence of national or local coping strategies*

Developing countries frequently do not have local or national capacity to cope with climate change in the form of extreme weather events: DMP is often a low priority in national disaster management strategies. Post-disaster reconstruction is given greater attention than DMP and reconstruction plans frequently ignore vulnerability issues. Local government has a greater capacity to undertake DMP than central government, but often lacks resources.

Section 7: *The extent to which the links between poverty and the environment are included in PRSPs*

Tearfund's partners in Central America reveal that national PRSPs lack sufficient focus on DMP. Without this focus, PRSPs cannot be sustainable.

Section 8: *Identification of countries or vulnerable situations that are a priority for adaptation*

Tearfund has undertaken a disaster risk assessment project and has identified the 20 countries most vulnerable to natural hazard related disasters. This information is used to identify those countries where a greater focus on DMP is most urgently needed.

Recommendations:

- Greater attention must be paid to the link between climate change and disasters and the implications these have for sustainable development (including health implications).
- If International Development Targets are to be met, disaster mitigation and preparedness must be awarded a higher priority in overseas aid programmes.
- DMP must gain a higher political profile, including being raised and discussed at the World Summit for Sustainable Development 2002.
- Donor governments must allocate more resources for DMP programmes in disaster prone countries, and place a greater emphasis on building their capacity to prepare for floods and droughts.
- Donor governments should raise developing country awareness of the need to address vulnerability issues in any poverty reduction strategy.

1. Introduction

Tearfund is a UK Christian relief and development organisation, working with over 400 partner groups in 90 countries to tackle the causes and effects of poverty. We value our relationship with partners and believe that partnership is the route through which we can most effectively assist the poor.

Tearfund has considerable experience in disaster management including preparedness and mitigation (DMP). Our disaster management over the last five years has been focused on relief and rehabilitation through our partners and Disaster Response Team (DRT).[1] The DRT has been operational for seven years, and has responded to disasters in Afghanistan, Liberia, Sierra Leone, Tanzania, Rwanda, and Zaire. It is currently operating in Burundi, Sierra Leone, southern Sudan and Serbia. As a result of the increasing frequency of climate related disasters in developing countries, the DRT has broadened its mandate to include a response to these. Tearfund also responds to climate related disasters through its regional teams and partners. These have included the Orissa cyclone, flooding in Bangladesh, Hurricane Mitch, and the long-term drought in Afghanistan for which Tearfund launched an appeal before the war on terrorism began.

Tearfund's experience in DMP has included the running of training of trainers workshops, and community based DMP programmes in collaboration with the Oxford Centre for Disaster Studies, the EU and DFID. The Tearfund-initiated "Training of Trainers in Disaster Management" manual has had wide distribution to partners, governments and NGOs. Following Hurricane Mitch Tearfund launched a new disaster preparedness and mitigation policy, and committed itself to integrating DMP into all its disaster management work. It also undertook a risk assessment project to identify the 20 countries most at risk from both conflict and natural hazard related disasters. This data is used to identify countries where a greater focus on DMP is required.

---

[1] Tearfund is a member of the Disasters Emergency Committee.

2. ADVERSE EFFECTS OF GLOBAL CLIMATE CHANGE

2.1. *Extreme weather events:*

Tearfund is very aware of the seriousness of global climate change and the implications it has for sustainable development. We are particularly concerned about the links between global warming and extreme weather events. We acknowledge that climate change is not necessarily responsible for all extreme events, but recognise the connections between them. The links between global warming and the severe flooding experienced by Mozambique in 2000, for example, are documented in the 2001 Christie and Hanlon report (which Tearfund helped to fund), Mozambique and the Great Flood of 2000. We are deeply concerned about the Intergovernmental Panel on Climate Change's (IPCC) predictions that the global incidence and severity of floods and droughts is likely to increase with intensified warming.[2] We have already observed a steadily rising number of storms, floods and droughts in the countries our partners work in, and have witnessed their effect on the poor in terms of loss of life and livelihoods. Our regional teams and partners are frequently frustrated by the way in which their on-going development work is affected by major climate related disasters.

2.2 *The effect of extreme events:*

Climate related disasters have implications for life, livelihoods, the environment, and infrastructure.

Following Hurricane Mitch which struck Central America in 1998, Tearfund provided emergency support in the form of grants to 21 partners located in Honduras, Nicaragua, El Salvador and Costa Rica. Our partners informed us of the devastation caused throughout Central America by floods and mudslides. The impact of Mitch was particularly devastating to Honduras, with the loss of thousands of lives, 70 per cent of the country's roads and bridges destroyed, and the main pillar of the economy—the agricultural sector—almost wiped out. Tearfund's partner MOPAWI, which has been working in the Mosquitia region of Honduras since 1985, wrote the following assessment following the disaster:

"Amongst the damages reported to date, the most prevalent include environmental damage: contamination of rivers, lagoons and drinking water, fallen trees along riverbanks caused by erosion, natural barriers destroyed, change of the river's natural course, and damage to local fauna. Significant damage has also been noted to local agricultural production: the majority of the crops were destroyed, including rice, beans, corn, plantains and bananas, root crops, cacao and citrus fruit. Damage to housing and local infrastructure includes damaged and destroyed homes, health centres, schools, roads, small bridges and boats".

Tearfund partner Project Global Village (PAG) also reported:

"The force and volume of water destroyed mini and major watersheds; community water supplies were severely damaged or completely destroyed".

A similar situation to that of Honduras was reported by Tearfund partner HEED in Bangladesh after the severe flooding there in 1998. HEED made the following observations:

"The exceptional floods have left many thousands of families displaced from their homes and without access to basic essentials for survival. The rapid rise of the flood waters has caused much damage in housing, food stocks, water supplies, growing crops, livestock and small businesses.

After the flood, it is not possible for rural agricultural workers to find any employment and their families will suffer extreme hardship having lost much, if not all, their basic supplies . . . In addition many people have lost their means of generating income which further restricts their recovery and causes breakdown in the local economy."

We are very concerned about these adverse effects of climate related disasters. We are particularly concerned about loss of livelihoods. We acknowledge the seriousness of loss of life through sudden death, but also recognise the slow death that loss of livelihoods causes by sending the poor even deeper into poverty and vulnerability. Extreme weather events, through damaging and destroying livelihoods (whether directly or indirectly through creating unemployment), can set back development by decades. Unless sufficient attention is paid to the impact of climate related disasters on livelihoods (and to economic recovery as a disaster response component) development will not be sustainable.

---

[2] Report of IPCC Working Group 2, "Climate Change 2001: Impacts, Adaptation, and Vulnerability".

Recommendations:

- Greater attention must be paid by governments, International Financial Institutions, corporations and businesses to the links between climate change and extreme weather events.
- Greater attention must be paid by donor governments to the implications that climate related disasters have for development, particularly loss of livelihoods. The on-going threat of hydrological extremes must be taken into account in all development initiatives with vulnerable countries.
- DFID should fulfil its promise to, as it stated in chapter five, section G of Achieving Sustainability: poverty elimination and the environment, "look at the effects of environmental disasters on long-term development plans".

2.3 *Health*

Tearfund are aware that climate change and climate related disasters have implications for human health. We are concerned about the predicted direct impact of climate change on health as documented by the IPCC, which includes a rise in heat and cold related illnesses and deaths and an increase in infectious and parasitic diseases such as cholera, malaria, dengue, and Chagas disease.[3] We have witnessed the indirect impact of climate change on health through responding to floods in Central America. Following Hurricane Mitch, our partner MOPAWI in Honduras informed us:

"With respect to water and sanitation, the flooding has contaminated most wells, and sources of water are not available or insufficient, resulting in extremely poor sanitary conditions . . ." "An alarming incidence of illnesses such as diarrhoea, dysentery, skin diseases, conjunctivitis, and respiratory infections has been reported in the Mosquitia and . . . epidemics of malaria, cholera and Chagas disease have been reported in other regions of Honduras".

Recommendations:

- With global warming and climate related disasters predicted to increase, we recommend that further research into the health implications of climate change is undertaken.
- Support to developing countries' health sectors should include assistance to plan for the health implications of climate change.

3. The Extent to which the Poor are Susceptible to the Adverse Effects of Climate Change

There is statistical evidence that the poor are more susceptible to the effects of climate change in the form of extreme weather events.[4] We perceive this fact to be the result of the link between poverty and vulnerability: poor communities are frequently forced to live on marginal land which is vulnerable to extreme weather events and where they lack the infrastructure to deal with them. Our partners in Central America responding to Hurricane Mitch observed the disparity between the ability of the poor and the rich to protect themselves from the flooding and mudslides that accompanied the hurricane. They reported that the poor were most seriously affected as they were living in high-risk areas such as hill slopes and river banks: many families living in these areas lost both homes and sources of income. The network of Honduran Civil Society Organisations INTERFOROS, with which Tearfund partners are linked, made the following statement in reference to Honduran communities living in areas exposed to extreme weather events:

". . . the hazardous situation of the people living in those areas is obvious, they usually lack the resources and means to flee from their condition of marginality and risk. The communities where several social organisations have sustained a local development strategy have somehow escaped from this critical situation."

The poor were also disadvantaged through not being adequately forewarned of the hurricane, and having no means of escape. Communities living in rural areas such as La Mosquitia received little or no information and had no means of evacuation. Tearfund personnel living in this area at the time wrote:

"Communications with the outside world are very poor, there exists no emergency procedures and the local Miskito people have no organised system to deal with such situations. It is not the place to be in the event of a hurricane".

---

[3] IPCC report, "The Regional Impacts of Climate Change" Chapter 6: Latin America.

[4] According to the International Federation of Red Cross and Red Crescent Societies "World Disasters Report 2001", on average 22.5 people die per reported disaster in highly developed nations, 145 die per disaster in nations of medium human development, and each disaster in countries of low human development claims an average of 1,052 people.

These statements reveal the link between low human development and vulnerability. Tearfund partner KOINONIA, based in Bangladesh, also observe this link. Following the floods of 1998 KOINONIA undertook a programme of emergency aid in rural areas. They informed us that the poor were most severely affected by this disaster, particularly in the Gopalgani district where flooding had prevented them from cultivating the land they depended upon:

"The huge area of submerged low land (in the Gopalgani district) is surrounded by four unions namely Kajalia, Kalabari, Kushala and Radhaganj. The locality is mainly inhabited by the most disadvantaged and underprivileged farming and fishermen community, day labours, poor landless and share cropper, marginal and small farmers. The mainstay of the local people is agricultural work. But for want of a proper drainage system agricultural work cannot be carried out by the poor rural farmers successfully. The fierce flood of the last year has destroyed even the last remaining grains of crops of some of the higher grounds".

In view of the link between low human development and vulnerability, it is of great concern to us that developing country governments frequently do not have the resources or capacity to look beyond the reconstruction stage after a disaster has occurred to reduce the vulnerability of the poor through economic development or even disaster preparedness. An associate of Tearfund based in Honduras made the following observation with reference to the capacity of the Honduran government following Hurricane Mitch:

"The Central government . . . has not had sufficient capacity to attend, in a reasonable manner, the demands of the organisations and citizens that have come before it looking for support to overcome their problems provoked by Mitch".

"The Master Plan for National Reconstruction and Transformation (PMRTN) has not become a concerted plan . . . it is lacking the legal, material and human resources needed to surpass its merely physical perspective of reconstruction . . ."

Where a government cannot respond to its citizens' needs through adequate rehabilitation and development, the poor remain poor and vulnerable. When disaster strikes and destroys livelihoods, inequality of socio-economic conditions is aggravated even further. Thus disasters both expose and widen the gap between rich and poor.

Recommendations:

- If International Development Targets are to be met, disaster preparedness and mitigation must be awarded a much higher priority in overseas aid programmes, especially for the most vulnerable regions and countries.
- DMP needs to gain a higher political profile.
- We urge the British Government to ensure that the issue of DMP is raised and discussed at the World Summit on Sustainable Development in August 2002.

4. How the Adverse Effects of Global Climate Change Can Be Mitigated

Major hurricanes and floods attract instant media interest and rapid humanitarian response, but it is not enough to support immediate crises through relief activities without enabling communities to prepare for and mitigate against the effects of future disasters. Thousands of lives could be saved each year in developing countries if more emphasis was placed by governments on preparing vulnerable communities for extreme weather events. A large range of preparedness and mitigation measures are possible, many of them relatively cheap and simple to implement. They cover areas such as building location and construction, emergency shelters, food production and storage systems, reforestation and the establishment of early warning systems and evacuation routes. Where communities have undertaken preparedness and mitigation measures, the effect of the disaster has often been significantly reduced.

Bangladesh

An estimated 8-10 million people live within the high risk coastal areas of Bangladesh. A Tearfund consultant undertook an evaluation of cyclone shelters there in July 2000 and made the following general observation on the effectiveness of shelters:

In 1970 a cyclone with a storm surge of 25-30 ft high hit the coast of the Bay of Bengal. The storm surge raced inland at a speed of 150 mph, killing over 300,000 people. Since this disaster, various plans to mitigate the effects of cyclones in high risk areas by erecting cyclone shelters have proved effective in reducing loss of life. The cyclone of 1991 was of similar size to that of 1970, yet loss of life, partly on account of these shelters, was reduced to 140,000. Local inhabitants on the coastline south of Chittagong pointed out that while over 21,000 people had lost their lives locally, those who made it to the multi-purpose cyclone shelter were all saved.

India

Another of Tearfund's partners NEICORD, based in North East India, has undertaken disaster preparedness and mitigation activities in the Brahmaputra Valley. Rainfall in the region is heavy and floods are frequent. Among its activities NEICORD has promoted and observed the effectiveness of early rice growing as a food security measure for times of flood. The system is being adopted by communities in the region living near NEICORD's project sites which have recognised its benefits.

Recognising that disaster preparedness and mitigation saves lives, Tearfund and its partner agencies around the world have identified DMP as an indispensable tool to tackle suffering and poverty.

5. Funding Adaptation to Climate Change has a Substantial Role in Mitigating its Adverse Effects

Tearfund is concerned about the fact that disaster mitigation and preparedness has traditionally been a backwater of international funding policy, with DMP being a low priority in overseas development assistance. Moreover, DMP remains a low priority in domestic disaster management strategies; where developing country governments have funded relief and reconstruction programmes, funding has often not stretched to DMP programmes. Through discussions held by Tearfund with representatives of the governments o f Nicaragua and Honduras in September 2001, it became clear that DMP was low on the list of priorities for disaster management spending.

We have not only observed that DMP proves effective in reducing loss of life and livelihoods, but we also believe that the cost of investing in DMP compared with the costs incurred by relief and reconstruction post-disasters is very low. The World Bank and the US Geological Survey have calculated that economic losses worldwide from natural disasters could be reduced by 280 billion US dollars by investing around a seventh of that sum in disaster preparedness (International Federation of Red Cross and Red Crescent Societies *World Disasters Report 2001).*

Recommendations:

- The UK government should increase its official development assistance to 0.7 per cent of GNP within a specified period.
- Donor governments and NGOs must allocate more resources for assisting disaster prone countries develop DMP strategies and implement community DMP programmes.

6. The Presence or Absence of National or Local Coping Strategies

The ability of developing countries to cope with the effects of climate change in the form of climate related disasters is frequently reduced by their lack of national and local strategies for disaster mitigation and preparedness.

Nicaragua:

Tearfund held discussions in September 2001 with partner organisations working on community DMP in Nicaragua; they revealed that DMP is a low priority on the national governmental agenda. Many of our partners and associates expressed concern over their government's failure to adequately address the need to engage in DMP, including its failure to implement its own disaster management law which was introduced in March 2000. A recent survey conducted by the NGO "Civil Co-ordination for Emergency and Reconstruction" (CCER) revealed that 83 per cent of high-risk communities in Nicaragua still feel unprepared for disasters.

Honduras:

A similar situation is repeated in Honduras. An umbrella association of NGOs based there informed us that the national government's focus is on disaster reconstruction rather than preparedness and mitigation and its reconstruction plans tend to ignore issues of vulnerability. The association have been lobbying the Honduran government for the implementation of its DMP law, but have yet to see success. Several of Tearfund's partners in Honduras are involved in a disaster mitigation network "La Red de Mitigacion". A representative of the network informed us that Honduras suffers from a lack of environmental and disaster mitigation consciousness.

In both Nicaragua and Honduras Tearfund were informed by partners that where the governments do engage with DMP it is generally on the municipal level, and it is on this level that co-operation and co-ordination between government, NGOs and civil society groups tends to happen (on a limited basis). Our partners observed that local government frequently has more capacity to respond to disasters than central government, being more accessible and accountable to citizens, more knowledgeable of their needs, and better placed to fulfil them. However, all of our partners in Nicaragua and Honduras informed us that while local level government has a higher capacity to engage in DMP, it is severely restrained by a lack of funding.

Haiti:

Tearfund's consultant in Haiti informed us that Haiti regularly and frequently suffers the effects of extreme weather events such as hurricanes and droughts. While the Haitian government responds to these events with (limited) relief interventions, it has no policy or budget for preparedness and mitigation programmes. National preparedness for hurricanes and floods is non-existent: there is no hurricane warning system, and no procedures for evacuation. There is a lack of general knowledge about disaster preparedness, with nothing established in the education system to inform children. The average citizen will not be aware of an imminent hurricane or flood and will not know what to do when it strikes. In the consultant's own words, "when it (disaster) happens, it happens. Hurricanes come: people die".

It became apparent through our discussions with partners and their associates in Central America that lack of emphasis on DMP extends beyond national boundaries. Where Central American countries have received external assistance post Mitch, this has frequently ignored issues of vulnerability. A long-established association of civil society organisations in Central America made the following statement:

"Most of the external co-operation, which has increased since Mitch, has been frequently invested in works of physical reconstruction and assistance programs with dubious efficacy and sustainability"... "The vulnerability of the geographical regions more affected by Mitch or exposed to destructive natural phenomena still persists".

Recommendations:

- Donor governments should place a greater emphasis on building the capacity of governments and communities in disaster prone countries to prepare for and respond to storms, floods and droughts. We urge DFID to implement its priority of building developing country capacity to prepare for disasters (chapter five, section 5.15 of *Achieving Sustainability: poverty elimination and the environment*).
- There should be a particular focus on providing adequate resources for local government to implement and maintain local level DMP plans within a coherent national strategy.
- A participatory approach to long-term flood and drought management in developing countries should be encouraged, in which local communities, NGOs, local and central government communicate and collaborate together.
- Issues of vulnerability to future disasters must be considered in all external post-disaster assistance.

7. The Extent to which the Links Between Poverty and the Environment are Included in PRSPs

Through recent consultations with Tearfund partners working in disaster preparedness and mitigation in Nicaragua and Honduras, it became apparent that DMP is not given sufficient focus in national Poverty Reduction Strategy Papers (PRSPs). (The World Bank/IMF require low-income countries to produce a PRSP in order to achieve a link between debt relief and poverty reduction).

Nicaragua:

We were informed by our associate CCER (Civil Co-ordination for Emergency and Reconstruction), that DMP was not included in Nicaragua's PRSP. This information was confirmed by the Humboldt Centre (Centre of Development and Environment in Nicaragua). We also consulted the executive secretary of the government department responsible for disasters ("National System for Prevention, Mitigation and Attention to Disasters") who agreed that the country's PRSP lacked attention to DMP. He also observed a need for a general increase in prevention awareness in Nicaragua.

Honduras:

We consulted the association of NGOs ASONOG with which Tearfund partners are involved and which works closely with the national government department for disasters (COPECO). ASONOG informed us that the PRSP for Honduras lacked sufficient attention to the links between poverty and the environment, and excluded disaster preparedness and mitigation. Tearfund partner PAG (Project Global Village) which educates communities in disaster preparedness and mitigation confirmed the lack of DMP within the country's PRSP.

All of Tearfund's partners collaborating with the governments of Honduras and Nicaragua recognise the importance of the inclusion of DMP within PRSPs. Our partners are concerned that without sufficient attention to the design and implementation of a national disaster preparedness strategy, PRSPs will not be sustainable.

Finally, the question of national government capacity to implement PRSPs once formulated was also raised. The following observation was made by ASONOG:

"It seems that even for government units and programmes there is not a clear understanding on how the PRSP and the reduction of vulnerability is going to be implemented".

Recommendations:

- Donor governments must place a higher priority on raising developing country awareness of the need to address issues of vulnerability in any poverty reduction strategy.

8. Identification of Countries or Vulnerable Situations that are a Priority for Adaptation

Tearfund's Disaster Response Team have undertaken a study to identify the countries most at risk from conflict and natural hazard related disasters. The list of 20 countries most at risk from natural hazard related disasters has been produced according to annual average number of people killed and affected by such disasters between 1990 and 1998, size of population and levels of social vulnerability. Please see the attachment that accompanies this paper for the results of the study (*Annex 1*).

The following statistics were used to produce the "top 20" countries:

ANNUAL AVERAGE KILLED BY NATURAL HAZARDS 1990–98

Bangladesh	16,954
India	5,536
China	3,694
Nigeria	1,753
Philippines	1,664
Peru	1,402
Afghanistan	1,363
Vietnam	1,077
Indonesia	1,039
Pakistan	936
Nepal	785
Burkina Faso	714
Honduras	686
Niger	633
Russia	545
Tanzania	542
Sudan	481
Haiti	446
Mexico	440

ANNUAL AVERAGE AFFECTED BY NATURAL HAZARDS 1990–98

China	117,363,000
India	27,500,000
Bangladesh	14,571,000
Philippines	5,257,000
Pakistan	2,693,000
Thailand	1,753,000
Malawi	1,663,000
Kenya	1,414,000
Ethiopia	1,386,000
Vietnam	1,289,000
Brazil	1,194,000
Sudan	1,160,000
Zimbabwe	1,129,000
North Korea	1,004,000
Tanzania	873,000
Mozambique	817,000
Indonesia	693,000
Peru	527,000
Burma	515,000
Argentina	515,000

ANNUAL AVERAGE KILLED BY NATURAL HAZARDS AS PERCENTAGE OF POPULATION

	Population	*Annual Av Killed 1990–98*	*Killed as % Population*
Bangladesh	127,118,000	16,954	0.013
Honduras	5,997,000	686	0.011
Guinea-Bissau	1,235,000	136	0.011
Iran	65,180,000	4,516	0.007
Papua New Guinea	4,705,000	313	0.007
Haiti	6,884,000	446	0.006
Nicaragua	4,717,000	301	0.006
Niger	9,962,000	633	0.006
Burkina Faso	11,576,000	714	0.006
Somalia	7,141,000	404	0.006
Afghanistan	25,825,000	1,363	0.005
Peru	26,625,000	1,402	0.005
Comoros	563,000	27	0.005
Tajikistan	6,103,000	227	0.004
Nepal	22,021,000	785	0.004
Zambia	9,664,000	290	0.003
El Salvador	5,839,000	172	0.003
Congo	2,717,000	68	0.003
Chad	7,557,000	159	0.002
Philippines	79,346,000	1,664	0.002

ANNUAL AVERAGE AFFECTED BY NATURAL HAZARDS AS PERCENTAGE OF POPULATION

	Population	*Annual Av Affected 1990–98*	*Affected as % Population*
Malawi	10,000,000	1,663,000	16.630
Guyana	705,000	89,000	12.624
Bangladesh	127,118,000	14,571,000	11.463
Zimbabwe	11,163,000	1,129,000	10.114
China	1,246,872,000	117,363,000	9.413
Philippines	79,346,000	5,257,000	6.625
Dominican Republic	8,130,000	506,000	6.224
Swaziland	985,000	59,000	5.990
Fiji	813,000	48,000	5.904
Zambia	9,664,000	478,000	4.946
Kenya	28,809,000	1,414,000	4.908
North Korea	21,386,000	1,004,000	4.695
Honduras	5,997,000	278,000	4.636
Nicaragua	4,717,000	212,000	4.494
Mozambique	19,124,000	817,000	4.272
Papua New Guinea	4,705,000	177,000	3.762
Sudan	34,476,000	1,160,000	3.365
Thailand	60,609,000	1,753,000	2.892
Tanzania	31,271,000	873,000	2.792
Namibia	1,648,000	46,000	2.791

The following country specific observations were made in a consultancy report drawn up for Tearfund's Asia team:

Bangladesh:

Bangladesh has the highest average numbers killed by climate related disasters in the world. Increasing river floods and land erosion are displacing millions a year, and there is a future severe threat to 11 of 130 million living in coastal areas as a result of sea-level rise. Government and agencies are experienced in disaster preparedness and response but less so in mitigation.

India:

India has the second highest number of people killed and affected by environmental disasters in the world. It is under high threat of cyclones, floods and increasing El Nino related droughts and sea-level rise. The national government presently lacks the capacity and resources for disaster response, preparedness and mitigation.

Philippines:

The Philippines is the most disaster prone country in the world, with a very high frequency of cyclones and floods, an increasing frequency of El Nino related drought, and prone to earthquakes and volcanoes. The government is well organised and prepared for disaster response but less so for disaster mitigation.

Recommendations:

Tearfund recommends that aid interventions and capacity building programmes are focused on those countries where frequency and severity of disasters is highest and national coping capacity is low.

Tearfund

January 2002

Annex 1

COUNTRY RISK RATING—NATURAL HAZARDS

	Natural Disaster				*Social Vulnerability*			
	People Killed	*People Killed % Pop'n*	*People Affected*	*People Affected % Pop'n*	*Human Poverty*	*Undernourished*	*Undernourished % Pop'n*	*Result*
1	Bangladesh	Bangladesh	China	Malawi	Niger	India	Somalia	Bangladesh
2	India	Honduras	India	Guyana	Burkina Faso	China	Eritrea	China
3	Iran	Guinea-Bissau	Bangladesh	Bangladesh	Sierra Leone	Bangladesh	Burundi	Philippines
4	China	Iran	Philippines	Zimbabwe	Ethiopia	Ethiopia	Mozambique	Ethiopia
5	Nigeria	Papua New Guinea	Pakistan	China	Central African Rep	Pakistan	Afghanistan	Mozambique
6	Philippines	Haiti	Thailand	Philippines	Mali	DRC	Haiti	Afghanistan
7	Peru	Nicaragua	Malawi	Dominican Rep	Chad	Brazil	DRC	India
8	Afghanistan	Niger	Kenya	Swaziland	Nepal	Philippines	Ethiopia	Haiti
9	Vietnam	Burkina Faso	Ethiopia	Fiji	Guinea-Bissau	Thailand	North Korea	Kenya
10	Indonesia	Somalia	Vietnam	Zambia	Benin	Vietnam	Mongolia	Somalia
11	Pakistan	Afghanistan	Brazil	Kenya	Guinea	Afghanistan	Chad	Burkina Faso
12	Nepal	Peru	Sudan	North Korea	Gambia	Tanzania	Zambia	Pakistan
13	Burkina Faso	Comoros	Zimbabwe	Honduras	Senegal	Indonesia	Angola	Niger
14	Honduras	Tajikistan	North Korea	Nicaragua	Mozambique	Kenya	Sierra Leone	Tanzania
15	Niger	Nepal	Tanzania	Mozambique	Yemen	Mozambique	Central African Rep	North Korea
16	Russia	Zambia	Mozambique	Papua New Guinea	Madagascar**	North Korea	Liberia	Honduras
17	Tanzania	El Salvador	Indonesia	Sudan	Mauritania	Nigeria	Kenya	Malawi
18	Sudan	Congo	Peru	Thailand	Cote d'Ivoire	Somalia	Tanzania	Zimbabwe
19	Haiti	Chad	Burma	Tanzania	Burundi	Yemen	Madagascar	Zambia
20	Mexico	Philippines	Argentina	Namibia	Haiti	Madagascar	Zimbabwe	Vietnam
				*Countries without HPI Rating****				
21	Kenya	Cameroon	Dominican Republic	India	Bangladesh	Uganda	Niger	Thailand
22	Somalia	Gambia	Zambia	Lesotho	Malawi	Sudan	Bangladesh	Nepal
23	Mozambique	Zimbabwe	Sri Lanka	Haiti	Pakistan	Mexico	Yemen	Peru
24	Turkey	Mali	Madagascar	Burkina Faso	Bhutan	Angola	Rwanda	Chad
25	Cameroon	Sierra Leone	Burkina Faso	Ethiopia	DRC**	Colombia	Malawi	Iran
26	Egypt	Mozambique	Honduras	Cuba	Uganda	Haiti	Congo	Sudan
27	Papua New Guinea	Tanzania	Cambodia	Cambodia	Morocco	Sri Lanka	Cambodia	Indonesia
28	Thailand	Laos	Cuba	Madagascar	Laos	Nepal	Laos	Guinea-Bissau
29	DRC	Togo	Mexico	Mauritania	Togo	Peru	Cameroon	Papua New Guinea
30	Nicaragua	Equador	Nicaragua	Niger	Zambia	Zimbabwe	Nicaragua	Nicaragua

** Out-of-date HPI Values Used

*** Awarded Points for Place 20: Somalia, Eritrea, Angola, Afghanistan, Liberia

Memorandum submitted by Netherlands Red Cross

INTRODUCTION

The International Federation of Red Cross and Red Crescent Societies is the world's largest humanitarian organization, providing assistance without discrimination as to nationality, race, religious beliefs, class or political opinions.

Founded in 1919, the International Federation comprises 178 member National Red Cross and Red Crescent societies. There are around 97 million members and volunteers in the Red Cross Red Crescent Movement worldwide, of whom an estimated 20 million people are volunteers. In 2000, 50 million people around the world were assisted by the Red Cross Red Crescent movement.

According to the 2001 World Disasters Report, more disasters were reported in 2000 than in previous years. However, the year 2000 saw significantly fewer people killed by disaster—some 20,000 as compared to the average of 75,000 per year during the previous decade. But the number of people affected by disasters went up to 256 million compared with an average of 211 million per year from 1991 to 2000, and an annual average of 147 million in the 1980s.

A major cause of the increasing number of people being affected by disasters is the increase in the number of hydro-meteorological disasters such as floods, wind storms and droughts. Since the mid-1990s, the reported number of weather-related disasters has doubled. They now account for over 90 per cent of all deaths from natural disasters. The effect on lives and livelihoods is immense, and the economic effect on a country's development is considerable. The average amount of estimated disaster damage during the 1990s was 81 billion dollars per year (2000 prices), of which weather- related disasters amounted to nearly 55 billion per year (68 per cent). Since the 1950s, costs associated with natural disasters have gone up 14 times. And some agencies estimate that the future costs of climate-related disasters over the next 20 years could range from 6–10 trillion dollars—10 times more than the projected flows of aid/ODA.

The frequency and effect of disasters, particularly in the last decade, has increased at such an alarming rate that vulnerable populations do not always have the opportunity to recover from one disaster before the next one strikes. As a result, disasters are threatening the possibility of achieving the 2015 development goals set by the OECD. Staying a step ahead of the next disaster is becoming increasingly important. This is why the IFRC has identified disaster preparedness as one of the four core areas of activities for itself and for National Societies under Strategy 2010.

Not only the current statistics of increasing numbers of hydro-meteorological disasters and people affected are a source of great concern. Reports by in particular the Intergovernmental Panel on Climate Change have further increased our anxiety. The IPCC expects climate change to lead to more floods, more droughts, more areas affected by vector-borne diseases, and millions of people affected by sea-level rise and forced to move.

Humanitarian organizations will be among the first to respond to the impacts of climate change. This realisation was the prime motive for the Netherlands Red Cross in the beginning of 2001 to explore the possibilities of a Red Cross/Red Crescent Centre on Climate Change and Disaster Preparedness. In the process of establishing the centre, where we have now entered the final stage of decision making, I have had the privilege of talking with many people from both the international humanitarian relief and disaster science community as the "climate change community".

We are hoping to build a bridge between these communities at local, national and international levels. I hope that some of my observations on this process can be helpful in the context of this hearing.

Observations

1. Climate change is still dominantly regarded as an environmental issue. In most if not all countries, the Ministries of Environment have the lead in developing the national climate-change policy and in negotiating internationally in the framework of the UNFCCC and related fora. As a result, the humanitarian and development perspective of climate change, in particular in developing countries, is still hardly developed.

2. The prime objective of international climate-change policy development and research has been understanding the climate change problem and trying to solve it. This is reflected in the funding and "intellectual investments" into working groups 1 and 3 of the IPCC, which is generous compared to the limited contributions to working group 2. Likewise, the negotiations in the UNFCCC are dominated by debates on policies and measures that can be adopted to reduce GHG emissions.

3. Adaptation to climate change in developing countries is a barely touched subject, both in the work of the IPCC and in the UNFCCC negotiations and in bilateral and multilateral ODA-programs, where mitigation of climate change is the dominant element of climate-change-related programs with developing countries.

4. Involvement of Civil Society is generally regarded as an important factor in the success of development programs. However, Civil Society organisations engaged in climate-change issues are predominantly environmental NGOs. Development agencies and humanitarian agencies have largely been absent in fora where climate-change issues are discussed and policies and programs are developed.

Reasons for this could be:

- that they regard climate change as an environmental issue, which is not their priority;
- that climate change is still a rather abstract issue, with many uncertainties, which makes it difficult to assess what climate change could mean in the context of their national and often locally-oriented strategies and programs; and
- that other humanitarian and development issues are perceived as far more urgent.

As a consequence, civil society organisations are hardly involved in the development of climate change adaptation strategies, let alone actual programs.

5. Humanitarian organisations have a lot of experience in dealing with extreme-weather events. This experience could be very beneficial to both the development and the implementation of climate change adaptation programs in development countries. This can be particularly relevant for organisations such as the International Federation of RC and RC societies which is already heavily involved in disaster preparedness programmes.

6. Not only is the interaction between non-environmental civil society organisations and the climate change community (consisting of both scientists and policymakers) limited, but there is little interaction between experts on climate change and experts in the area of disaster studies at the scientific and policy-making level. Likewise, there seems to be little interaction within Ministries between humanitarian divisions and the divisions dealing with the impact of climate change in developing countries.

7. Awareness of the impact of climate change and extreme-weather events is a condition for the development of plans of action to mitigate these impacts, be it at international, national, local or even at household level. Awareness is the first step in improving the resilience of people and communities. However, very little is done in this area. Given the reporting in the national communications to the UNFCCC, it seems that the commitments made under Article 6 of the UNFCCC have been given the lowest priority in both Annex 1 and Non-annex 1 countries, and have received the least, if any, resources. The disaster preparedness programs of the RCRC are already based on awareness raising, lessening impact of disasters and preparing for them. There is definitely an opportunity to use this to include awareness of the impacts of climate change and extreme weather events.

When formally established, the Red Cross/Red Crescent Centre on Climate Change and Disaster Preparedness aims to assist in the process of bringing climate scientists, policymakers, operational humanitarian organisations and others involved together to stimulate greater awareness of the impact of climate change on the lives of people in vulnerable positions, in particular in developing countries, which should result in robust policies and concrete programs that will increase their resilience.

Netherlands Red Cross

February 2002

Examination of Witnesses

Professor Ian Davis, Cranfield Disaster Management Centre, Miss Sarah La Trobe, Publicity Policy Officer, Tearfund, Mr Andy Atkins, Director of Advocacy, Tearfund, Ms Madeleen Helmer, Development Officer, Climate Centre, Netherlands Red Cross, and Mr Jonathan Walter, Editor of the World Disasters Report, examined.

Chairman

98. Thank you very much for coming to give evidence today. What we are trying to look at today are: the sorts of factors that contribute to increased vulnerability; clarifying whether there are development goals that inadvertently increase vulnerability; examining the extent to which disaster mitigation and preparedness can help developing countries adapt to climate variability; and determining the capacity and institution building needs of developing countries with respect to extreme weather events and disaster mitigation and preparedness. We have a number of questions we would like to put to you. In answering the questions, if you have specific examples, those are always very helpful, or if at any time you think in relation to a question that there are policy changes that DFID or anyone else ought to be making, please do tell us. Could I ask about the World Disasters Report 2001? There seems to be some sort of debate about whether fewer people have been killed in natural disasters, even though more people are being affected. What do we learn from the World Disasters Report 2001? Mr Walter, perhaps, as you edit the World Disasters Report, you could tell us something about what it tells and what we should learn from that.

(*Mr Walter*) For the first time in 2001 we divided up so-called natural disasters into hydrometeorological or weather-related and

[**Chairman** *Cont*]

geophysical. That threw up some quite interesting results. It showed that since 1996 the number of reported hydrometeorological disasters had doubled while, throughout the decade, the number of reported geophysical disasters had remained fairly even. It also showed that over 90 per cent of those killed and affected by natural disasters were killed or affected by hydrometeorological disasters. It showed, in terms of disaster damage, that the picture is more mixed: about two-thirds of the economic damage is due to hydrometeorological disaster. So we are seeing a trend of increasing weather-related disasters, if you like, over the last decade. I have gone back to our data providers, CRED, based in Belgium in Brussels, and I have asked them to go back over the last 30 years to try and get an even clearer picture. They have reported that for natural disasters, on average in the 1970s nearly 200,000 people a year were killed. That has come down to about 80,000 a year during the 1980s and the 1990s. So actually deaths do not seem to have decreased much over the last two decades. You have to compare that with the increasing number of disasters. Relatively speaking, the numbers of people killed per reported disaster is coming down. However, in terms of people affected, the picture is very different. In the 1970s, about 73 million people on average a year were affected by natural disasters. That has gone up in the 1990s to in the region of 200 million people a year. In fact, in the year 2000, 256 million people were affected. We see a clear increase in the numbers of people affected, and we also see an increase since the 1970s in economic losses. For the 1990s compared to the 1970s there is a five-fold increase in economic losses. That is the picture from the statistical point of view.

(*Miss La Trobe*) To add to that, with climate change expected to intensify, according to the Intergovernmental Panel on Climate Change, we are going to see an intensification of floods and droughts. When you take into account the population growth and poverty, you are going to see an increased number of people affected by disasters. The level of disaster mitigation and preparedness in developing countries is going to need to be dramatically stepped up by having to cope with the situation.

Hugh Bayley

99. If you look at the number of people affected, not the number of people killed which may be influenced by better or less good disaster responses, it appears to me to be increasing broadly in line with an increasing population. If you have a more densely populated planet and one million hectares are flooded, you would expect more people to be affected. Would it not make more sense to see what proportion of a population in at-risk areas is affected, rather than looking at straight numbers?

(*Mr Walter*) That is a very good point and it is something that we also looked at for the first time in the map which goes with the 2001 report. I have a copy you can see later. We make a very simple calculation, taking the total population of every country in the world, and then we divide that by the average number of people killed and affected by natural disasters. It throws up the Solomon Islands, interestingly, as the most disaster affected country over the decade with something like 40 per cent of its population affected or killed by disasters. There is a map which shows proportionately how all the countries of the world are affected. I might add that since the 1980s, the number of people affected has gone up by nearly 50 per cent. I think that is a greater increase than the increase in the world's population.

Mr Battle

100. Sarah mentioned about the level of preparedness that needs to be dramatically stepped up. This morning in my constituency the newspapers are full of photographs of the River Wharfe flooding because of heavy rains—a month's rain in a day in Yorkshire for the River Wharfe and the houses were flooded last October. People are still having building work done from flooding the year before. One person commented on the TV, "We have been sitting here and all that happens is that it happens. The Government should stop it happening". That person was asked whether that meant the Government should stop the flooding and the rain. We are not that prepared here, building on the flood plains. What happens to people who do experience disasters after the disaster: do they go back to even more vulnerable livelihoods or do they improve the situation? What support would NGOs and donors give to local people to empower them to avoid it happening again, or do they just move away or stand on the roof until the water has gone down and hope it does not happen again?

(*Professor Davis*) The first point about it is that people often recover very slowly and sometimes fail to cope with a disaster. However, there have not been enough studies made of the long-term recoverability of societies. For example, one of the main problems is the indirect consequences of a disaster. If a disaster wipes out a banana crop, what happens to all those people who grow bananas until the crop has grown again? It might take three and a half years for that to happen. Of course, the banana industry will intercept the market share, so that when they do recover the banana trees, they will not get back to where they were before. The port of Kobe in Japan is 15 per cent under its capacity before the earthquake, although port facilities have been completely rebuilt, because Yokohama and other ports have intercepted their market share. That will inevitably have consequences on the workforce. Thus, the indirect consequences of the disaster of course are often catastrophic for communities. We liken it to a ratchet wheel that gets tighter and tighter as a community is pushed back and back by repetitive disasters. So the consequences are a very serious issue. You ask what happens to people. For example, in Bangladesh many of the people in Dhaka in squatter settlements are there because the past cyclones, floods and droughts. They have migrated there because that was their coping mechanism in response to these threats. Although they now contribute to the disaster problem in Dhaka, that was their loophole There was a study made some years ago in Dhaka which indicated that up to 24 per cent of the squatters were there as post-disaster victims who migrated there for that reason. We need to know a lot more about the questions you

[**Mr Battle** *Cont*]

are raising concerning the dynamics of human behaviour. Sometimes the situation is a lot less optimistic than the reporters suggest.

101. Is it just a question of studying it or should the donors do something now on working with local people? Are there any examples of proactive work on this?

(*Professor Davis*) I personally think it would be a productive improvement if when an agency has an appeal for funding for, say, victims of Hurricane Mitch or the Turkish earthquake, they tell the public that a designated proportion of the money is going to be spent in the long term to assist in long-term recovery. Maybe 10 per cent could be earmarked for that purpose. Long-term rehabilitation and recovery are often starved of resources, whilst relief is often over-provided.

102. Then we would have to change the rules here because the adverts or the agencies restrict them to just raising money for the earthquake at the time; it is short term and they cannot use the money, if I remember rightly, more longer term.

(*Professor Davis*) That is right and that rule was put in place for a good reason, to try and make sure they spent their money in a designated time, but it does stop them using money for longer term inputs.

(*Miss La Trobe*) I would like to add a small case study to that. Tearfund's partners in Nicaragua worked with communities in the aftermath of Hurricane Mitch and they helped them to rebuild houses on new land that was not vulnerable; it was away from the risk of flood and volcano. But the communities lacked the capital to begin new economic activities, and so several families just began to migrate back to their old vulnerable land, because that was where they could farm. We think there needs to be a much greater level of support for disaster victims.

103. I actually visited that project in Nicaragua.

(*Mr Atkins*) I am not sure whether you will come to this issue later but it is perhaps relevant here anyway. We can talk about it later if you think that is appropriate. On the question of what donors can do, obviously Tearfund is a medium-sized, voluntary organisation supporting local partnerships, and there is a role for that. I think, from what we have seen and heard in visiting partners and talking with them, that they would say there is a need for the international community to acknowledge the importance of DMP—disaster, mitigation and preparedness—much more and to focus much more resources within the overall development strategy on that. We believe that this should be integrated into longer-term development programmes, but that does not mean it is lost. There is a danger that integration actually means disappears. We do not think, from our discussion with partners, that disaster mitigation and preparedness has nearly a high enough profile yet to prevented it being lost if you just regard it as integrated. It needs to be integrated but to have its own identity within that. The second thing is the linking of that to national development programmes, whether they are poverty reduction strategy programmes or national strategies for sustainable development. Whatever name they go under, there needs to be a clearly identified component on disaster mitigation and preparedness. The third thing is that we have to make sure that one reaches the local level because in the immediate aftermath of a disaster most lives are saved or lost in the first 24 to 48 hours. It is the local community pulling their relatives out from under buildings, pulling them out of flood waters and so on, long before the international community arrives. Unless you can get resources into the local communities, which is a very simple thing, this is not high-cost technology but simple measures, you may have a beautiful national disaster reduction plan but the locals may know absolutely nothing about it. This is what we have discovered in talking to our partners in Central America most recently. It is a big job for the international donor community to beef up the amount of money they give to this within the overall development programme and making sure that it does reach the local level, and does not just stay in the hands of national bureaucracies that may have a wonderful plan and good maps on their wall but actually these are irrelevant to the locals.

Andrew Robathan

104. I particularly want to turn, leading on from that, to what factors increase vulnerability. You talked about national plans and so on. I am particularly interested in how you can address the factors of increased vulnerability and how, in your disaster mitigation and preparedness plans, you can look at addressing those factors and the structures and systems you might need. Can you lead on from that to what examples there are where this has been successful? If you take Bangladesh or the floods in the deltas of Bangladesh, what has the impact been upstream of deforestation over the foothills of the Himalayas and so on?

(*Miss La Trobe*) One of the factors that increases vulnerability is lack of good national government laws and policies on issues such as deforestation and land. Deforestation, as we all know, increases vulnerability through increased risk of flooding and landslides. In Honduras, Hurricane Mitch was made worse because of the massive amount of deforestation that was happening there caused by illegal logging and cattle ranching. The government did have a forestry law in place for 20 years but that was totally obsolete. It really allowed cattle ranchers to deforest as much as they liked. This bad government policy contributes to vulnerability and similarly the lack of a good land policy. This is the case in Honduras as well. A lot of land is concentrated in the hands of the rich and the poor do not really have rights to this land. So they are forced to live in vulnerable areas. Our partners in Honduras worked with communities in the Guymas Region. Before Mitch, they had had such a struggle to obtain any land and when they finally obtained it and started farming there, Mitch wiped out all they had and then they had to start this whole struggle to obtain land again. They only obtained it in the end from the local municipality by blocking the road from Tegucigalpa to San Pedro Sula to protest at the government's inertia. If they had not undertaken that protest, they probably would not have obtained the land. These types of bad policies contribute to vulnerability.

[**Andrew Robathan** *Cont*]

105. That is a very good point. Could I lead on from that? You say it is rich farmers and they tend to be the people who kill the rain forest for cattle ranching, if I get this right, and they probably exploit the wood as well. One of the things in Central America which I have seen is slash and burn which appears to be for displaced people who are trying to find some land. How does that impact on this?

(*Miss La Trobe*) That is a really serious issue as well. Our partners in the Mosquitia region of Honduras have been tyring to teach locals alternative methods to slash and burn because that is destroying the land. They are learning alternative methods. That needs to have a bigger impetus and there needs to be a lot more of this kind of teaching because it is a combination of illegal logging and then farmers coming in. It is often because farmers are poor and they do not have any alternative and they have not been taught other methods.

(*Mr Atkins*) That last point is very important. Elsewhere in Latin America there is the same process. You would not have the degree of slash and burn if the poorer sectors of the rural community had legal rights to reasonable quality land. If you have no capital, if you have no land, the only option left open to you is to go further into the rain forest, the virgin territory, and cut down more. The soil erodes very quickly because the poor do not have the money for fertilizers or the training and understanding of appropriate methods to keep up the fertility, so slash and burn goes on and on. What usually happens is that the big ranchers come in behind, buy up the land, or in the case of countries like Colombia, just shoot them off it, and the poor keep going further on. The ranchers just come on behind. If you allowed the poor legal land tenure in the first place on reasonable quality land, you would not get slash and burn. They do not do it for fun; they do it because they have no alternative.

(*Professor Davis*) I have a comment concerning success stories. One of the areas where we have seen dramatic progress in the years I have worked in disaster planning, (and I started in the early Seventies), is in warning systems, and particularly in flood warning and cyclone warning systems. For example, Hurricane Michelle, devastated parts of the Caribbean in October of last year. There was a major threat to Cuba which has a remarkably good warning system, and they evacuated somewhere in the order of 600,000 people from Havana and I think there were just 12 deaths. That achievement merited less than half an inch of press reporting in the UK, and yet this was a brilliant success. Then you have got warning systems which DIPECHO—a project of the European Union—have funded in a number of Caribbean countries: Jamaica, Haiti, the Dominican Republic and Cuba, where local communities have been taught to manage their entire flood warning system. They have taught hazard-prone communities how to use laptops and have supplied them with the equipment and taught them how to measure the rain gauge data, water flow data, right down to evacuation planning. This is a complete revolution because previously you would have one body generating the information, (such as meteorologists and hydrologists), then passing this warning to intermediaries such as local authorities, and finally to "recipients", the local people to evacuate. Now that is all in *one* group. It raises other problems such as what happens downstream for the next group and so on. However, these kinds of warning developments are most impressive. I give you another example. I am an architect and my background is very much in strengthening local vernacular buildings against, say, earthquakes or cyclones and flooding. In this field there has been great progress made in teaching local builders how to build more safely. The tragedy is that the civil engineering profession does not take much interest in non-engineered construction. That is a battle which is being fought out in many countries. India, Bangladesh, China, Colombia and Peru have taken a big lead in this whole area of non-engineered construction. If we are to see deaths reduced in many of these building failures, we have got to see more activity in this area. I believe there are success stories in mitigation and preparedness but they are under-reported because that does not make news. Part of the problem is that the public do not know about achievements in risk reduction and the story is one of "gloom and doom". Perhaps the agencies might be able to help here. The World Disasters Report has done a magnificent job in trying to alert people to the need for improved focus on preparedness and mitigation.

(*Mr Walter*) I would like to add that it is important to make the point that continuing development as usual will not, in its own right, reduce vulnerability. There are numerous cases where development actually increases vulnerability. There are well documented examples: the Krishna Delta, for example, in India where mangrove swamps which used to act as a break to the storm surges created by cyclones have been cleared for prawn farming and then the prawns, which are a mono-crop, have been destroyed by subsequent cyclones and land reform associated with that has thrown many small-holders into destitution. It is important that both development and humanitarian initiatives look through, as it were, a lens of risk reduction. Picking up on your point, there is a danger of DMP getting lost. It is not a separate sector; it is something which everyone has to take seriously. Poverty alleviation as usual, business as usual, will not necessarily reduce vulnerability.

106. May I say that I think all the illustrations, development of poverty and environmental problems, are interlinked. Could I ask about one specific case, which some of us saw a couple of years ago which is the flooding in Mozambique. That was enormous and came right down from Zimbabwe and elsewhere. Can you point to what governmental mistakes have been made that increased the vulnerability of Mozambique to flooding; it was not just the Mozambique government but perhaps other governments. Have you studied that at all?

(*Mr Walter*) Mozambique is a bit of a success story, certainly in 2000, compared to many other floods. I have data which shows that 45,000 people were actually saved in the rescue phase; two-thirds of them were saved with Mozambican resources—the army, the Red Cross, fire service and private boats. Only 4 per cent of the lives saved in both the 2000 and 2001 floods were saved by international agencies. That is a very powerful demonstration of the need to build national level and local level disaster

[**Andrew Robathan** *Cont*]

preparedness capacity. The success of the 2000 response was largely because the government took a lead. They appointed their Foreign Minister to co-ordinate the disaster relief. All the agencies, the UN and 9 separate military air forces, were co-ordinated under the Foreign Minister. That demonstrates that when you have the political will to take a lead, then something will happen. If disaster preparedness and mitigation remain at the level of the environment ministry or some other civil defence ministry, it will not come together. Co-ordination is key. That was led by the government in 2000 in Mozambique. In 2001 it was not quite so good because the floods were further up-country, further away from the capital, which was where a lot of the national expertise was focussed.

(*Professor Davis*) You are asking what governments can do. I think that one thing governments need to do—and maybe DFID could help with this—is to encourage good protocols between countries over flood management. For example, one of the causes of the two floods in Mozambique was the release of water from Zambia and so on upstream. Whilst the WMO have good protocols for exchanging information on hurricanes, which is an excellent system, that rarely exists in river systems. An agreement of this nature is needed between Nepal, India and Bangladesh. Of course, there is always the argument that upstream countries dump their surplus water into our country to protect their dams. That may be true. The requirement is to form agreements concerning the exchange of information on water flows and an understanding of how to manage the overall river catchment, which might cross three or four countries. Possibly the UN, pushed by the British Government, can try and get better understandings to prevent repetitions of what happened in Mozambique.

Tony Worthington

107. You mentioned the percentage of people who have been saved or helped by local initiatives. The perception in this country is that it was all done by helicopters. Do you know the percentage of people who were saved by helicopter?

(*Mr Walter*) I could get back to you on that.[1]

108. There is a serous point to it about how disasters get distorted by the media coverage.

(*Mr Walter*) I think there was a distortion in the 2000 floods because the world's media were already in Mozambique because there were four floods; the third one was the big one and the media were already there. These images of helicopters with white South Africans saving black Mozambicans were very powerful and they were the ones that made good news but actually boat owners saved as many, if not more. The helicopters were important subsequently in ferrying food around between all the refugee and displacement centres, but in the lifesaving phase it was local, national and regional resources which made the difference. I have the data here, which I can give you.

Ann Clwyd: May I say that three of us from this Committee were there at the time. There was a shortage of helicopters and in fact they were scrambling them from South Africa. It if had not been for the South Africans, in fact I think a lot more lives would have been lost. So we were able to see at first hand what went on at that time. As for the kind of co-ordination that you are talking about, I do not think it was quite like that in the early stages. In fact, it was quite the opposite.

Chris McCafferty

109. You have given the Committee members some graphic illustrations of development activities actually undermining or causing extra vulnerability. Professor Davis has mentioned the need for a dialogue. Is there any dialogue at all going on between centres of excellence and governments actually to educate decision-makers about the problems that can arise from certain types of development which can adversely affect calls for mobility? Is that dialogue taking place at any level at all?

(*Professor Davis*) I think this is an interesting issue. I have been on the board of various NGOs, and there is often quite a lot of tension between the development group in an NGO and the disaster community within the same NGO. Sometimes it is to do with the perception that the disaster group are getting more resources; it is at that level. I think the development people within NGOs and also within government are often overwhelmed by their agenda. I was once given an assignment by DFID to go to the various geographical desks of DFID and highlight two issues: one, how to make sure development projects did not increase vulnerability; and, secondly, to make sure that their development projects did not end up in the Bay of Bengal, so that they did not have new roads and bridges being wiped out and so on. To put it mildly, we got a very frosty reception indeed from the development staff because they said, "Look, we are up to *here* with agenda items. We have to go through every project checking it against a massive agenda such as gender, sustainable environmental factors and so on and so forth, and you are giving us another?". Our response was that we were trying to heighten their awareness of these issues and to see how mitigation could be built into all their planning. I could see their problem: they felt they had such a huge number of factors to consider in all their development planning that it was difficult to add yet another one to the whole process. Is the dialogue continuing? I believe it is because I think that the development community working in government, in the UN and within the NGOs, is becoming increasingly sensitive to the threat that is posed by disasters to all of their work. The very fact that this Committee is considering this issue today is a good example of that. I think it is getting to be rather a healthy dialogue, but there needs to be more of it. The debate needs to be stronger and I think the issues are being gradually recognised by the development community. In a sense, the people advocating

---

[1] floods in Mozambique in 2000–01, 53,000 people were rescued from drowning. Of these, 63 per cent were saved by boat and 37 per cent by aircraft. Furthermore, national assets (Mozambican military, Red Cross and boat owners) rescued 65 per cent of those saved.

[**Chris McCafferty** *Cont*]
preparedness and mitigation are coming from a development standpoint. Undoubtedly the concerns are growing and that is partly due to the lead taken by some of the big NGOs, particularly the Red Cross.

Mr Colman

110. This follows on in terms of this linkage between development and disaster preparedness and mitigation. One of the areas on which the UK Government is having a round table and on which it is preparing a report for the World Summit on Sustainable Development this September is fresh water and sewage, but you have clearly pointed out that the other area directly related to this is watershed management and the dumping of excess water and likely flooding downstream in the coastal areas, et cetera. Could I ask if anyone on the panel, and obviously particularly Professor Ian Davis, believes that the way in which the work is being done on this report is in fact taking account of what we are discussing here this morning or do you think this has been left out of discussion on fresh water and sewage?

(*Professor Davis*) I am not familiar with that activity, I am afraid. I hope it is being taken into account because obviously it is such a key factor. My colleagues in the Flood Research Centre in Middlesex University will always say that you need to consider holistic aspects of a river catchment: pollution control, water supply, flood and land drainage etc. That is one problem and it requires an integrated approach. In Britain I think we are beginning to see that but in many countries it is fragmented in a host of different organisations. To try and get that equation together probably requires the meeting of many disciplines and a great deal of understanding of other people's fields. Of course that must happen, but often it does not happen adequately. I would hope that we could get some input into that. I would be delighted to contribute in any way.

(*Mr Atkins*) There are a number of initiatives, as I know you know, going on around the World Summit with the Government having set up five different initiatives, the water initiative being one of those. Our perception to date—and one of my staff is on the steering committee for water—is that fresh water has been the primary focus and particularly the role that the private sector could play in helping deliver and manage water supplies in developing countries. It is necessary to look at that, but that clearly is not enough. We have recently been working with DFID to try to get the whole issue of disaster mitigation and preparedness, particularly the water aspects of that, if you like, on to the agenda, not necessarily within that committee, that working group, but elsewhere. I think it is worth referring to the good things DFID has done. In the Environmental TSB there is mention of the need to do more work on the impact of environmental disasters, on development and so on. What we are less clear about is what has actually happened. There are good words in here. I am not saying that nothing has happened; we are just not clear. It may be something for you to look into more. We think the groundwork is there, the basis is there for doing more, but we are not clear about where it happening.

Mr Khabra

111. If the advantages of an environmental project are perceived to be far greater than the disadvantages of dealing with the disaster—and there has been criticism of some of those projects being funded by the World Bank or the IMF—and those advantages bring many benefits to the community which is affected by the disaster, how would you balance your views on that?

(*Professor Davis*) I think that the answer goes back to risk assessment. I read about the linking of the poverty reduction agenda and the disaster reduction agenda and that goes back to the need for communities that are at risk to conduct really sensible risk assessment processes. Often risk assessment is confined to hazard mapping, dealing with the flood – severity, frequency, duration—and not enough on vulnerability—social vulnerability, building infrastructure vulnerability, economic vulnerability, and environmental vulnerability. I have just been working with the ISDR – the International Strategy for Disaster Relief – which is a UN organisation. We are doing a global survey on mitigation. I have just waded through 70 country reports. Very few of the countries seem to have effective risk assessment in place. That is probably due to political reasons, that people are happier to look at the neutral technical factors causing flooding or high winds and not become too involved in *why* people are at risk and *who* put them in a vulnerable location. So there appears to be a disinclination on the part of many governments to push for total risk assessment. But if risk assessment is done, the key element in it would be of overall capacities, thus to survey not just the negatives but all the positives. This dual emphasis has been a very important development in risk assessment by looking at vulnerability and capacity analysis in parallel, so that you not only see the weaknesses of a given society but you see their strengths. These might be local leadership or the memory of older people within a community or the presence of assisting groups such as Tearfund. The need is to devise programmes which start from asking what the capacity of the community is, not from some abstract notion. There is a need for better community-based risk assessment and risk assessment at various levels, so that we really diagnose the problem better. Too often programmes for mitigation and preparedness are devised without adequately diagnosing the problem. It is like conducting a surgical operation without an X-ray, which is very dangerous, and yet that is happening in country after country.

112. When I think of the impact of climate change, one country comes to my mind, and you have already mentioned Bangladesh with its floods, cyclones and droughts. That has had a disastrous effect on the life of the people. I wonder whether the Government of Bangladesh has a proper policy and proper management to deal with such a disaster. The question is: what specific management and policy weaknesses in developing countries in particular have the greatest impact on vulnerability to climate change, particularly responses to extreme weather events?

[**Mr Khabra** *Cont*]

(*Professor Davis*) My colleagues will have much more to say on that than I have. I was interested in the earlier evidence to this Committee by Dr Huq who referred to the fact that there was a dramatic reduction in cyclone deaths in a more recent cyclone than the 1991 event. Of course, that is partly due to the Bangladesh Government taking disaster mitigation very seriously: good warning systems, better cyclone shelters, mounds where animals are taken during a cyclone and much better management of natural resources within the country. Bangladesh is in many ways a great success story of disaster mitigation. Another place is the Philippines and Colombia, these countries are front-runners. I think Bangladesh has built up a form of "safety-culture", and that is a great tribute to the people there, and particularly to the NGOs. Obviously there are problems: the residual problems, lack of strong, local institutions, lack of political continuity between elections, lack of ethical standards to avoid corruption, for example, in the enforcement of building codes and so on. Such problem are pervasive—and many derive from poverty. I think we should pay tribute to the work of certain countries where great progress has been made. Every time I return to Bangladesh, I am aware of dramatic progress from the time before. Although they have a huge problem, the success in managing disasters with a population of that size in a country not much bigger than Wales is extraordinary.

113. What sort of co-operation has the Bangladesh Government had with the Government of India? In particular, you mention that there was a dispute about diverting river water and that dispute has been going on for quite a while. It has a more damaging impact on Bangladesh than on India.

(*Professor Davis*) I believe that tension continues. In my view, it is high time that the Government of India and the Government of Bangladesh had a much higher level of collaboration. Failures in disaster collaboration simply reflect political tensions.

(*Miss La Trobe*) There are a lot of countries where DMP just is not a priority. If they have a disaster management law in place, DMP will not necessary be a part of that and that is something that we have seen in Central America. There was a lack of general knowledge, awareness and planning within the communities and within government for DMP because they just did not see it as a priority. If governments were engaging with disasters, it would seem to be more focussing on the technology. They are quite interested in cyclone warning systems and that sort of thing but they just were not engaging in the grass roots community DMP. So we believe that DMP needs to become a much bigger national, public value incorporated into government level disaster management and development initiatives, as well as into communities.

(*Mr Atkins*) May I add something to what you have heard from others, which perhaps needs to be spelt out and that is actually how cheap many of the things that need to be done are. We are talking at the local level about risk management; it costs but it is not necessarily very expensive. We are talking about marking routes to higher ground and just agreeing who will be in charge of X if Y happens. These are very low cost measures at the local level compared with the billions that are pumped into developing countries for other purposes. That is the first thing to be said. We are really not talking rocket science; we are talking about a shift in mind set to do many things that can be very quickly and easily done, if there is a mind to do it. The second point that Professor Davis raised was about political continuity. We have found this over and over again in talking to our partners in other countries, that a particular government will have a push on a particular issue—disaster mitigation and preparedness—and it makes it their project, but the moment they are out of office, the next government deliberately does something different to show that it is different. That points all the more to the need to have local resources because it is the local community organisations that do not change every time there is an election or a change in political flavour, whether it be the churches, the mosques, or the local NGOs. They are there and they do not go away just because there is a political change. That is not to say we do not need national strategies because we do, but it is very important to understand the implications of lack of political continuity and therefore the need to make sure that resources are in a place where they will not suddenly disappear when the mayor is voted out or whatever.

(*Mr Walter*) Can I add an example of what good value DMP initiatives can be, taken from last year's World Disasters Report? During the super cyclone in Orissa there were 23 cyclone shelters which the Orissa Government claims saved about 40,000 lives. The budget for these was paid by the German Red Cross. From 1994 to 2002 the budget was DM 6.8 million, which works out, and it is a crude calculation, at approximately US$77 per life saved. After the disaster, the Orissa state government promised the next of kin of every dead relative US$1600 in compensation.

Mr Colman

114. I was surprised to hear your condemnation of the democratic process. Have you any examples where dictators or single party states are much better at disaster preparedness than democracies?

(*Mr Atkins*) It is not a condemnation of the democratic process; it is a recognition that many of the countries we work in do not have a professional civil service. There is a very big difference.

115. You would still say that if you get a change of government because the elections bring in different priorities, you have to start again?

(*Mr Atkins*) It can even happen here.

116. I am pleased that it happened here in 1997! Some of my colleagues may differ. Do you have any examples that by actually having, as you say, a continuity of political control, you would get better disaster preparedness?

(*Mr Atkins*) I think if a plan is a good plan, it is good that it can be continued. Certainly it does not have to stop just because the government changes. Certainly, even in discussions in Nicaragua where there was considerable criticism of government plans, there was still an attempt to carry on the good

[**Mr Colman** *Cont*]

work from one government to another. I am not saying nobody is trying, but it does make it very difficult, particularly when you do not have professional civil servants, and so many of the local political actors and the state functionaries change every time the president changes. That is more the problem.

117. That happens in the United States?

(*Mr Atkins*) Yes, it does.

118. I am sorry to press you but could you have examples where in fact by not having a change, there has been a more solid preparedness in place?

(*Mr Atkins*) I am struggling to think of one, if I am honest. They must exist.

119. You have both made the same point.

(*Mr Atkins*) I am not a world expert on this. We could probably find you cases. What is clear is that if it is at local level, historic memory, the memory of people who have lived through past floods, rather than a mayor who has just been brought in to serve for four years and goes again, you are much more likely to get that continuity, for very obvious reasons. It is not a political statement but just a fact of life.

(*Mr Walter*) The example of Cuba's preparedness for Hurricane Michelle in November last year raised shows that the continuity of political leadership has led to a relationship of trust between the government and communities which is essential for early warning and disaster preparedness to work. The key word is "trust" there.

(*Professor Davis*) When we train national leaders in disaster planning, and we do that continually, one of the aspects we often highlight in setting up national disaster plans is the need for them to build political consensus. We propose that they devote time to consult with the opposition when working in democratic systems to see if they cannot fully agree on disaster planning, so that this does not become a political football. For example, in America, there is a very interesting disaster mitigation initiative which was started under the Clinton administration called "Project Impact", which was the concept of safe communities. There were to be two per state in all of the American states, (which included places like Puerto Rico). These safe communities were conceived to be a bringing together of private sector, NGOs and government, to say, "We will collectively make your whole town safe so that business and people will want to come and live here, because they are not going to be washed away in future flooding". This project went ahead during the Clinton administration and under the Bush administration it was changed because the new administration wanted different policies for FEMA (the Federal Emergency Management Agency). An important change happened in so far as it became more state controlled, so there was a policy of giving more authority and the project changed its name. In a sense, it looks as if the same policy is going to continue but it is going to be called something different. This has been quite an important correction. Some of the centralisation present in the original project has now been given over to more indigenous control. One of the key policies that we have been advocating is far higher levels of devolution to local communities. Disaster planning has to work very well for the community level but also at the centre. It is a top-down and bottom-up process in a synchronised, integrated system. I just feel that perhaps the political problems should not arise if there is better advocacy and better preparation done by the people advocating change.

Chris McCafferty

120. This is really a question that is directed to the Netherlands Red Cross. I would like to know the reason behind the creation of the Centre for Climate Change. A lot of the dialogue this morning has probably provided the answer to that, that simply there is a need. What will the centre actually do? What do you hope that it will achieve? What will be the benefits to developing countries?

(*Ms Helmer*) The reason we established the centre was in fact not so much because of what has been contained in the discussion we have had this morning. The reason lies very much in the work done by the IPCC, particularly the second report and the third report which came out at the beginning of last year. The data of the Intergovernmental Panel on Climate Change, which we know applies to our field of operations, formed a prime motive in setting up this centre because we realised very much that if all this comes true and the signs are so serious, there will be more floods and more droughts and the numbers of people affected will be beyond our imagination. Humanitarian organisations are the first to deal with this situation. The combination of the awareness of those two issues prompted us to develop this initiative. I must admit that it is easy to realise that this is a problem for us to deal with rather than to elaborate on what it means for our organisation and expertise. It is not an issue that automatically enters the minds of our own people. That partly has to do with the history of and the culture around climate change: it has been seen very much as an environmental issue. People say that because it is to do with the environment they do not have to deal with it, other ministries will deal with that, other politicians and experts will deal with it. It is a self-confirming circle. We are concerned about that, we are in the wrong box, so to speak. We need to get out of that as soon as possible. We feel that we must raise awareness. I receive clear comments from my colleagues telling me that climate change is something for the future that will be dealt with under the environment and that we have more pressing things to deal with. That is fair. I find it very difficult to go to my colleagues in Africa and raise the alarm bell of climate change when I know we can hardly deal with the humanitarian problems of the HIV/AIDS epidemic. Who am I to tell them there is another urgent issue coming up? That is the kind of day-to-day problem that we have to deal with in terms of the climate centre; we have to respect and acknowledge that and further elaborate on how to deal with climate change, although I must say that the HIV/AIDS experience is another driver for us because we acknowledge that we were too late on that catastrophe. We do not want that to happen again.

121. What other sources of expertise are available to decision makers and do you anticipate a dialogue? I imagine that you hope that the centre of excellence

[**Chris McCafferty** *Cont*]
will be a source of expertise for decision makers throughout the world. Are there any other sources? Are there any similar centres available?

(*Ms Helmer*) We do not claim to be a centre of excellence in that respect as a scientific institute. We have learnt from our preparations over the last year that there are indeed many centres of excellence, both in the field of disaster studies and climate change. We think our added value is in operational skills, which are as important as scientific skills. We feel that our role could be to intermediate between those two expertise. That comes from the history of your hearings here, that there is so little interlinking between different expertise and experience. That is where we hope to have a facilitating role. I give you a concrete example, and we are still in the preparation phase; we hope that in three to five years' time we will have a more solid opinion to give you. To give you an example, if there is a dengue epidemic coming up in south-east Asia, which is the case at the moment, people there are worried about why this is happening there. They are looking at the health angle. We know that dengue is related to other things as well; it is known to be related to climate change and change of weather patterns. It might be helpful to bring the expertise of both together so that people in the area can predict it at the soonest time and be best prepared for what dengue might mean in the near future and the longer future and have plans in preparation and that the experts in dengue, from wherever they come, can provide their scientific back-up to that situation. We think that the local experience of people from our organisation places us in the good position as we are all over the world at the local level. We have made so-called Vulnerability and Capacity Assessments of the experience of people on the ground. This is done in more than 100 countries now at local level and that can be translated back into international negotiations, such as within the framework of the UNFCCC where we are concerned that the environmental angle is dominant. Little interest has been shown in work done on the humanitarian angle of climate change. We hope to play a role there as well as acting as a kind of intermediary with our local experience and international connections.

122. How do you relate to a government department such as DFID here in Britain?

(*Ms Helmer*) We are not there yet. We have had contacts with the European Commission very briefly, with the World Bank, our own Ministry of course, the UNFCCC and the GEF. One of the things we have noted is that, when it comes to development policies and climate change, the policy papers that are written and the policies that are implemented are largely related to mitigation in developing countries. I know from our own Ministry that they acknowledge that adaptation should be higher up the agenda but they still find it difficult to find the angle to it. It is the same with the European Commission. Germany has recently shifted its position. Before policymakers were not interested in investing in adaption because that does not solve the problem of climate change. The general thinking now is: yes, we have to relate to adaptation because we are not able to solve the problem and we must deal with the consequences of it. So you see a shift occurring in a number of "DFIDs" in other countries. But there is still a long way to go. For example, in the Netherlands and at European Commission level there is very little interaction between the development department dealing with climate change and the humanitarian department. The people dealing with climate change in the development department have an environmental angle. When you come from dealing with mitigation and have to turn to adaptation, that is more or less lost and I do not blame them for that. It would make more sense to look at the humanitarian department and their expertise with disaster preparedness than to look at adaptation in particular. That makes more sense in terms of concrete experience but apparently that has not happened in many development agencies. I think there is a world to win there.

123. So there is a role for an expert in climate change sustainability within, say, a department like DFID?

(*Ms Helmer*) Yes, but then looking particularly at the humanitarian expertise we and DFID and many other development agencies have in terms of the humanitarian angle.

(*Professor Davis*) I find I look at Holland and Germany with a lot of envy because they have moved a lot further than we have in Britain in developing close dialogue between government, academic groups, NGOs, etc. We could do far more in Britain in that area. In the light of this increase in vulnerability which we are all observing (whether it is due to climate change or to population growth or urbanisation), DFID should establish a very strong focal point, a national focal point, for mitigation and preparedness. The reason is that disasters are growing at a fairly heroic scale. I have been in Teheran recently and they were predicting a moderate earthquake in Teheran with something of the order of 500,000 deaths. It is unbelievable to think of that kind of prediction and yet there are such vulnerabilities in cities that we are going to see some fairly terrible casualty statistics in future years. This proposed focal point would be a well-resourced body which can really establish good dialogue, both with NGOs, academic groups and with DFID's own regional offices so that the expertise is there and dialogue is established and institutionalised. We have a national committee in Britain called the Advisory Committee on Disaster Reduction. DFID has an observer on that committee. I think that is just the starting point. We need to move a lot further forward in this area. I am sure that the work I have done in mitigation over the last ten years could have been far greater if I had worked more closely with government. We have had a decade of natural disaster reduction and throughout the decade DFID did support this work very effectively. They provided DFID staff for the national committee all the way through the IDNDR, and there was a budget for providing support for mitigation. Much of the present policy of DFID has been to fund the multinational groups like the World Bank and the UNDP who have received a substantial amount of DFID money to support mitigation/preparedness. Yet there is a need for accessible budgets to which NGOs and Academic Groups can gain access to conduct important applied research to strengthen this whole area where Britain has great expertise and

[Chris McCafferty *Cont*]
a tremendous amount to offer. I think we could do far more together, and the situation is fragmented at the moment. The leadership in this area probably has to come from DFID.

Tony Worthington

124. What I was going to cover I think has been covered, so I will not go over that. I get the impression that at the stage a disaster occurs there are now improving response mechanisms to bodies like OCHA, ECHO, DFID and so on at that stage. I am not at all clear what happens in the recovery phase about the allocation of responsibilities. You have tended to talk in terms of government but you then also mentioned the World Bank. That is the first time the World Bank or major credit institutions have been mentioned. Is it your perception that after a disaster has occurred, which may well indeed lead to further disasters, there is a mechanism in place to bring in not DFID kind of money but major capital money, major infrastructure money?

(*Professor Davis*) Yes, and that is happening. For example, the World Bank allocating major grants to Gujarat at the moment, as are the Asian Development Bank, and they have attached very stringent conditions. They have said "we will give this money as long as you strengthen your disaster management system", so there are strings attached. This money is coming in to finance infrastructure, rebuilding and so on and so forth, so there is a deluge of money coming in although it might not be enough because the demands are so great. We are watching a growth of the private sector in this field and these large funding bodies becoming very active players, in particular, the development banks, who have a key role to play in this area and they are aware of it. They are sometimes in competition with each other and perhaps things are not as synchronised as they could be but perhaps that is the nature of the international scene. In terms of the government control of recovery, it is probably best that that is dealt with by some kind of task force to try to bring together the different sectors but, as soon as possible it is best for reconstruction to be the business of the Ministry of Housing, the Ministry of Agriculture, the Ministry of Water Resources etc. It is best for it to be dropped *within* the existing systems so that there is no super ministry established, as it were, which is trying to deal with all the recovery process. It has got to become part of life, part of the normal political process, and the normal development process. I do sense that one of the neglected areas of this subject is the management and integration of recovery, just as mitigation is another neglected area. The one area that is not neglected is relief.

125. Let me take the specific recent disaster in Goma in the Congo where there is no government basically.

(*Professor Davis*) Yes.

126. Next to Rwanda, two states involved with a primitive kind of government. I cannot see what is going to happen there to mitigate the tragedy that occurred because of the earthquake.

(*Professor Davis*) The UN have a role there, of course, and there are NGOs performing a role and presumably local institutions involved. The local community showed remarkable resilience in disobeying the advice to move to another country, they went straight back in as soon as the lava flows ceased because they believed that was in their best interests and the aid had to follow them. Here there were well motivated communities, and I agree with you that without a government it is going to be very difficult. This is a Somalia type situation and I wonder who fills the vacuum in that kind of context. The most obvious answer is that the UN have a presence there and we must look to the UN as the best of the worst solutions in such circumstances. Without a government it is going to be very difficult to get a natural lead for that kind of recovery process.

(*Mr Atkins*) If I can just add, I think our experience is that unless you prevent people helping themselves then they will. So, government or no government, if the locals have a way of sorting their problem they will try very hard to do so. The good news about Goma is, despite all the problems of governance there, that there are local community organisations working, and Tearfund, and I am sure other NGOs, actively funding them to do that work. I think there is hope for Goma. There are other situations where a combination of circumstances prevents the community helping themselves. The community may judge that the best risk avoidance procedure is to cross the border but they are prevented from crossing, that sort of thing, and that is where things get very, very dangerous indeed because people cannot help themselves, the logical option is closed off to them. That has not happened in Goma fortunately.

127. The imagery that we have had all morning has been of rural disasters. I suppose water has been most frequently mentioned as the cause of a rural disaster but increasingly the percentage of people who are living in very, very large conurbations is going up and there must be disasters that occur there. I am not sure what you do in disaster preparation and mitigation there, or response?

(*Professor Davis*) If you take the terrible landslides that happened in Caracas a few years ago, which were due to phenomenal rain fall, you could say there were two kinds of mitigation needed. One is *direct* mitigation, trying to show people how to build on steep slopes, and land use planning controls to try to stop them building on dangerous slopes in the first place. Thus there are these direct measures to try to develop safe environments by a combination carrots and by sticks, sometimes it is law, sometimes it is public awareness, sometimes it is training, all sorts of things. Then you have indirect measures which are trying to strengthen rural development so that people do not feel the necessity to go to Caracas in search of work. Professor Huq in earlier evidence to this Committee said that he did not believe you could stop urban migration, and maybe he is right, but I think there is a very good reason for trying to do so by encouraging rural development to seek to arrest this propulsion of people to cities. They migrate to urban areas because they believe the options are better, and they are probably right, but they do not

[Tony Worthington *Cont*]

need to leave rural habitats if there could be counter-magnets in place. I think we have got to see mitigation as a two-pronged affair. You have got to deal with the immediate problem on the slopes of Caracas and Rio, you have got to deal with these problems that happen in these highly congested cities subject to every conceivable kind of disaster, but you have also got to address why they are making these migrations. Maybe the indirect process is a better core development but they are needed just as much as some kind of integrated strategy. A government deals with the cosmetics of unsafe conditions but it should also seek to deal with the causal factors in an integrated manner.

(*Ms Helmer*) One of the issues that is related to the motives of people and what is of extreme concern to us is the lack of awareness about what is happening and the great gap we see between what scientists tell us and the lack of sense of urgency about what is happening. Also, when you look at the commitments governments have made under UNFCCC on education, public awareness and training, it is the least developed agenda item of negotiations and it is something we seem to under-estimate as a soft issue, that it will go along the way, and of course the negotiations on emission reductions, etc., are politically more important. But for us awareness is the first thing needed to have to make people act in terms of increasing their resilience and being better prepared. I think also development agencies, and all of us, can do a lot more. It is a problem. How can we even imagine that our energy use is causing parts of Antarctica to break off or sea levels to be rising by metres and tens of millions of people having to disappear from where they have lived for centuries. It is almost beyond our own human capacity to deal with this but still we have to. I think that is the kind of urgency we need to get into our own way of dealing with it. We should not be the Cassandras of the world, we should discuss this together. It is not an instant disaster like Chernobyl or Bhopal or others, which could change the whole world, and we saw how 11 September which has changed the whole world. Climate change is not a similar kind of disaster but still the impact is of the same kind. We should do a lot more in terms of getting this message across to our own colleagues, to the general public, in the north and in the south.

Hugh Bayley

128. Could I go back to Mr Walter's example of cyclone shelters in Orissa. You told us that they cost of $77 per life saved. How is that calculated? Is it the number of people who sheltered in shelters divided by the cost of building the shelters?

(*Mr Walter*) Yes. It was not just the cost of building the shelters, it was the cost of all the associated activities, of training, of building disaster awareness and preparedness. The shelters are not just a physical thing, they are a whole—

129. Is that really a fair cost because that assumes that every one of the people who sheltered in the shelters would have died if they had not been in the shelters?

(*Mr Walter*) The Orissa Government claims that the shelters saved 40,000 lives. If you were to compare the figures in Bangladesh, in 1970 you may have heard before that up to half a million people were killed in a cyclone there; in 1991 about 130,000 killed; and then in a similar cyclone in 1994 the death toll was down to a few hundred. I think there is a role.

130. I am asking some hard headed questions because however much money the international community has to spend on disaster relief we obviously want to make sure that it is spent as cost effectively as possible because the most cost effectively it is spent the more mitigation and prevention and protection will be provided. On the face of it, even if one assumes that all those who sheltered would have died had they not had the shelter and the preparation, the comparison you made, $77 cost for each life saved, $1,600 the cost of a life not being saved, that only is a cost effective intervention if you can guarantee that every shelter that is built would be used and would save lives and that you would never build a single shelter in an area that does not have a cyclone. The whole point of these events is that they are unpredictable. It may well be that in that particular case it was a very cost effective measure but is it not important that you apply brutally strict cost effectiveness calculations to ensure that money is properly spent?

(*Mr Walter*) I think the danger of applying brutally strict cost effectiveness calculations is you would then lose sight of the humanitarian imperative, which is that saving lives is a good thing whether you save money or not.

131. But actually if you spend money less cost effectively you let more people die. Surely that is a humanitarian imperative too? It must be ethically right and right from a humanitarian point of view to use whatever resources you have to save the maximum amount of lives. Does that not mean that you must do a cost effectiveness evaluation?

(*Mr Walter*) Yes, I agree, I just think that it is extremely difficult to be very, very precise about defining the cost of something which does not happen. There is a preventive logic in trying to quantify something that does not happen.

Hugh Bayley: Of course.

(*Professor Davis*) If I may just comment. Some of the evidence coming in for this global review of disaster reduction is really on that point. The Canadian Government have said that we need to know far more about the cost of disaster losses in Canada in order to know how much money they can justify for mitigation. We need much more precision on this issue, and we are struggling to get accurate data. We are looking at three areas here. Firstly, we are looking at direct losses, the damage to buildings. Secondly, we are looking at indirect losses, the loss of livelihoods, the loss of markets and so on, and we are looking at intangible losses, death and stress to families and so on. These three areas can all be quantified to some extent, but it is not so easy with the last one. If you take, for example, buildings, we know that it costs about 20 to 25 per cent more to make a house cyclone resistant than to have a house that is not resistant. It costs extra to insert window shutters, put better hurricane straps on the roof etc.

[Hugh Bayley *Cont*]

You could, of course, calculate in Fiji the most hurricane prone areas of the country and work out what that cost would mean and then you could work out the normal cost of recovery and so on, so you could do those kinds of sums. I think you are completely correct in your questioning and if we are going to see major improvements in mitigation we have got to develop improved economic indicators, we have got to get much more precision into this business, and then we can present to governments and say "here you are, here is the evidence". Of course, there is always this question of when will the earthquake, hurricane, landslide, or flood happen in that precise area and there are lots of question marks about the location of future disasters. We know Dhaka is going to be flooded and we know Chittagong is going to be affected in a future cyclone that roars into Bangladesh. There will be areas where we can predict with tremendous confidence that disasters will happen. I think the economists have a lot to contribute here. It has been very interesting to see two British economists, Ed Clay and Charlie Benson, working consistently for the World Bank on precisely this issue. They have now produced up to 12 reports looking at the economics of disaster mitigation and that work that has been done, particularly by the Overseas Development Institute and the Institute of Development Studies from Sussex University, is very important in this area and they are world leaders in this field.

132. I was very taken by your ladder but it is at stage two of the ladder that you talk about cost benefit analysis as an indicator, it seems to me from the ladder, of the beginnings of a serious debate about how one deals with disasters rather than grandstanding about "we must do something". I am surprised that it does not appear as a guiding principle or a frame of reference for stages two and five.

(*Professor Davis*) I think it probably should. At the moment that is pretty notional as to where I put different elements in the sequence. I think it is vital to have statistical evidence to support the mitigation since in many cases there is a convincing case to be made for it. When I talk to economists they say that sometimes it is very hard to make a strong case, for long return yet high impact events. For example, Jamaica has not suffered a major hurricane since Hurricane Gilbert back in the late 1980s. Disaster authorities in Jamaica say "in a sense we need another disaster to fuel our budget because people are saying that if they have not had a hurricane in all that time, is there a need to spend money on strengthening school roofs?". This is the difficulty when you are not getting repeated punches, in a sense, to justify effort and expenditure. It does require a whole lot of effort. Maybe arguments might have to be used other than economic ones in that particular context. I think you are quite right, the justification for it should be fundamentally at the beginning of the process.

133. Before people go away horrified at my questions I should say that I accept also that it is not simple and if you have unpredictability it is very difficult to make a tight economic costing but where you do have data—everybody seems to be nodding to that—where you can make an assessment you should make choices based on whatever data are available.

(*Professor Davis*) Yes.

(*Miss La Trobe*) In this whole discussion about cost effectiveness and relief, I would just like to add that from our experience in relief and development it is important to take a long-term view of relief and try not to reconstruct risk. I know a long-term view of relief can be quite a controversial argument but we see that it is important for the prevention of future disasters. That is not just focusing on technical fixes but building in risk protection.

Hugh Bayley: Absolutely.

(*Miss La Trobe*) It is not always easy for relief agencies to do this. If the national policy denies people land then the relief agencies might not have much choice but to put up shelters in bad places. For example, our disaster response team noticed in Honduras that there were people in tents down the dual carriageway there and they had got pit latrines dug into the central reservation. You could say that is bad relief but the people did not have any land to go to and the landowners were not releasing it. As far as is possible relief agencies need to take a long-term view of relief but it is difficult sometimes.

Ann Clwyd

134. Most of the areas that I was planning to cover have already been asked. Listening to you talking I think of Montserrat because one of the first reports by this Committee when it was set up was on Montserrat and we went to Montserrat when the volcano was still erupting. What I found extraordinary was that there had been plenty of scientific reports written about what might happen in the future, I think it was about 20 years since the last volcano, but nevertheless the Government of Montserrat went ahead and built a brand new town on an area where scientific reports predicted they might be right in the path of another volcano. When we tried to follow through as to who was responsible in the Department for International Department, or the ODA as it then was, it was very difficult to find who had read the reports, who had acted on the reports' findings and so on and so forth. That was obviously an element of human error in not taking sufficient notice of the scientific predictions and yet still going ahead with building a brand new town which was engulfed in the volcanic ash when the last volcano took place. Do you think there is a difficulty in scientists communicating their concerns adequately to people? They also had a Disaster Preparedness Plan but unfortunately very few people on a very small island knew how the plan was going to work so, again, when you tried to find out who had communicated what to whom you found there had not been any communication. Montserrat was an island that we had responsibility for. It is all very well for us to criticise other countries in the world for not doing this or that but actually Montserrat was a prime example of where in our own Government in the past people have not acted in an adequate way.

(*Mr Atkins*) I wonder if I could come in there. I am not familiar with Montserrat sadly but in other places I think you find something quite mundane,

[**Ann Clwyd** *Cont*]

that people are so taken up with the urgencies of daily life that they are quite unable to deal with the mega catastrophe, creeping climate change, volcano, whatever it is, that so changes the parameters in which they are working, that they cannot begin to conceive of how to deal with the implications. I think one can be affected like that in a development NGO, or government department, or whole government, actually failing to grapple with an enormously different context that is out there because they are so caught up in the day-to-day minutiae of government, business as normal and so on. I think it speaks of the need for a real mind shift and the question is how do we bring about that mind shift to allow people to have a longer term horizon. There may be corruption at play, there may be inefficiency, there may be all sorts of other things, but much of it is the burden of just trying to get by at the local level, day-by-day and so on. We also have to be careful that we do not put all the onus for change on the developing countries, even if we are funding them, because, to go back to something my colleague said here, it is largely the western countries producing carbon dioxide leading to the atmosphere change, global warming and so on. I think there is a very real need for governments and civil society organisations to up the ante really on issues of sustainable consumption, energy use and so on. That may not be the focus of this Committee but it would not be fair to ignore that part of the equation and only concentrate on local developing country initiatives. Tearfund is, in its own small way, and we may have been late off the ground too, trying to educate our own supporters. The development agencies themselves cannot put their hands up and say "we are adequately aware of these threats". The threat of climate change is very, very big and we ourselves have only recently begun to grapple with what this means for the poor that we seek to serve.

Chairman

135. It comes back always to poverty, does it not, that the poorer the country the poorer the groups are and the more fragile and less able they are going to be to cope with changes, threats, disasters? That is a recurring theme.

(*Mr Atkins*) Yes, it is a vicious circle.

136. One cannot escape from the fact that this is an integral part of tackling poverty.

(*Professor Davis*) Just to come back on Montserrat, it does seem that there was a planning issue. This town of Plymouth was planned and it had a hospital, for example, which was approved by DFID to go into that area and the decision to build the hospital in that location ignored the volcanic risk assessments which had been undertaken. This demonstrates that disaster planning is a long way behind environmental planning. If we go back about 20 years, Environmental Impact Assessments (EIA's) were initiated, which are now normal practice. I am quite sure an Environmental Impact Assessment was done for Plymouth, but what has got to happen is that the terms of reference for these EIAs has to expand to include a Hazard Impact Assessment (HIA). It has got to be built into it, and there have got to be some teeth in this process so that whoever is doing the EIA will look at the hazards and they will consider it and that will be a key area in disaster prone areas. We just see the need for a new mechanism, a new planning requirement, which could be a very useful thing for DFID or the people involved in the dependent territories to look at. I am attending a meeting of the governors of some of these independent Caribbean territories, they are having a briefing day sometime in May, and one of the topics is about Environmental Impact Assessments post Montserrat because I think people are aware of that kind of pressure. It is always perplexing to me, working in disasters for about 30 years, to see what a low priority decision makers give to planning issues relative to hazard threats but it is probably because other topics weigh so much heavier. I see such issues through a tunnel of disasters and risk and so on whilst other people are seeing a multitude of other factors. Perhaps those of us in this community have got to be a bit more understanding and aware of that different dynamic. It would be very encouraging if your Committee could really strengthen the need for the importance of a wider remit so that we do not get more towns like Plymouth being devastated. We have got to move on and learn from these mistakes. They are painful lessons for the people who ignore them.

Mr Colman

137. This is really about the private sector investment and the insurance industry. Clearly you described Plymouth in Montserrat which was an area where there was no real private sector investment and, therefore, the private sector investors did not have a requirement to make sure they had insurance policies to insure their factories or whatever else. Are you finding that there is a getting together within the World Business Council for Sustainable Development and organisations like Swiss Re and Munich Re to discuss these issues saying, if you like, to the public sector "do not build that city there because we are not going to build factories there because frankly they are uninsurable"? Are you getting any sort of linkage between the private sector and the insurance and reinsurance industry and the public sector in terms of this long-term planning that you were mentioning?

(*Professor Davis*) Just to say that I think that it is encouraging, for example, in Britain to see insurance premiums being related to the occupation of flood plains and we are now going to see people who live in flood plains paying more for their insurance and that will become a good incentive not to live in dangerous areas. That is salutary. We see in the Caribbean, for example, a very interesting development in insurance cover of the Commonwealth Disaster Management, CDMA, which is a form of mutual insurance scheme where one country is covering another against natural disaster risks. CDMA has now become established. Certainly insurance is a powerful tool. In Barbados, you can get quite a significant reduction in your insurance premium if you follow the building codes. In another project, The Red Cross went into an arrangement with the Royal Sun Alliance in the Caribbean over training people in hotels and if the hotel chain had training, which the Red Cross provided in disaster preparedness, they cut their

[Mr Colman *Cont*]
insurance premium because there was less likelihood of damage. An exciting project in Fiji reduced insurance premiums if people undertook proper cyclone resistant housing. Here is a powerful tool which could be used far more frequently. Instead of punishing people for not living in the right place with land use controls, it is an incentive, as the home-owner saves money. I think the insurance industry has a major contribution to make in this area and it is beginning to happen. It could happen much more and it would be very encouraging if your Committee could stimulate the insurance companies and encourage them to do more and provide the necessary incentives.

138. Mr Walter, do Swiss Re and Munich Re subscribe to your report? Do you run articles from them?

(*Mr Walter*) Yes, we have run a few articles by members of Munich Re, boxes, and we have used some of their data. The Provention Consortium has been set up between the World Bank and a number of private sector operations to try and cross the different sectors. I understand from contacts within the World Bank that the insurance and reinsurance industry is still a bit cagey about getting involved, they are not at the stage of committing resources to this yet. I think there is still a big problem in the very poorest countries that cannot afford insurance premiums at all.

139. The UNDP initiative from 1999 was to address this with the European insurance companies and that might be one you might want to pursue. In the evidence that was given to us by the Cranfield Disaster Management Centre you mentioned this six week course which you are running, and I see that is still going on at the moment.

(*Professor Davis*) Yes.

140. Is the private sector involved in that?

(*Professor Davis*) Not enough is the short answer. Occasionally we have had private sector people apply to take the course but, no, they are outside the loop.

141. Where would they go to get their training?

(*Professor Davis*) I do not know where they are trained but they certainly do not get it from Cranfield and that is clearly a significant gap. We have often had people query why are we not sitting down next to insurers or next to people from construction companies or investment companies and I think that is a weakness. DFID and the FCO are funding government officials, occasionally NGO people, to come to these courses but they are certainly not providing the funding for the private sector, probably because the private sector would not regard our course as being particularly useful for them, if they are aware of it.

142. Plainly if you do believe there is another course that we should be aware of we could ask them to come in and that would be very helpful to us. If it is possible, perhaps an invitation could be extended to one or more of this Committee to be able to have a sample, if you like, in summer school?

(*Professor Davis*) We would be delighted to welcome you to our next course.

143. In order of priority can I ask what other measures should be put in place alongside early warning systems to help prevent loss of life from natural disasters? You have got a very interesting risk reduction chain in your evidence and over on the left-hand side you have got development of national disaster management systems and then a whole series of other things to do.

(*Professor Davis*) Yes.

144. Would you like to put that in order as to what you think the next moves are? If the other members of the panel have not had a copy of this—Have they?

(*Professor Davis*) No, they have not.

145. Perhaps the clerk could just pass it on to them because there is a menu of options there which have been proposed. Could I ask you first, Professor Davis, what do you think is the order of priority for the other measures that you put forward in your document? It is on page two.

(*Professor Davis*) I use the metaphor of a chain because disaster mitigation measures need to be very carefully integrated and the chain idea brings the idea of the "weakest link". Some of those parts of the chain are weak links at present. Insurance is particularly weak and yet it is potentially a very strong link. I also wanted to emphasise the relationship of measures. If, for example, you take Gujarat at the present time, they are building earthquake resistant houses and those houses are incorporating a new building code which has been implemented. It requires training on the part of craftsman and builders to apply that new building code but it also requires public awareness on the part of the occupants of the houses to understand what those measures are. For example, they are strengthening buildings by putting in cross walls, or sheer walls. Those walls are very vital for the strength of the house. If the people who live in the house are not told the structural function of the wall they will demolish it because they have a bigger family or some other reason. Here there is a clear link between a land use planning control, a building bylaw, a training programme and public awareness and yet it is rare to find anyone seeing that connection. Perhaps one of the points I was making with this chain was who is going to co-ordinate mitigation because, whilst relief is well co-ordinated normally in disasters with national disaster co-ordinators, I have never come across anybody co-ordinating mitigation. Maybe there is a good reason for that, because it is so broad and so big that it would be a burden for anybody to do it. However, governments could set up some kind of task force to try to get linkages where linkages are needed in the system. That is another of my proposals to DFID, that they might initiate some kind of study to see how mitigation is managed in country and how it can be better managed so that these kinds of crucial linkages are made. At the moment I have never seen those linkages made. When I highlight the issue to government officials they are often perplexed as to how to achieve such links. In the order of importance, if a country is very poor they might do the cheapest things first. Public awareness is a relatively cheap element. You can get disaster training into schools relatively cheaply through the existing curriculum. Iran teaches earthquake preparedness in every single school in the

[**Mr Colman** *Cont*]

country and that has not required a vast amount of money, it has required the Ministry of Education working with the earthquake specialists to synchronise it. Since every child in Iran is taught this subject, with over half the population being under 16 there is a fair chance of that getting key messages to the whole community. I think a lot of these public awareness issues could be easy. Mr Atkins' comment was very interesting and some of these measures are relatively cheap. In Australia they will paint flood levels on lamp posts. It only takes a geography teacher and a pot of paint and some good accurate information to be able to mark the 1979 or the 1885 flood level and he takes out his class of geography kids to explain the significance and there is a useful vertical risk map in the community. You could start with the cheap things and move up to the more expensive elements later. The most expensive things will be the structural measures, such as flood protection measures, and the strengthening of the houses. I am a great believer in addressing the softer issues before reaching the harder ones because too often countries have said they cannot afford mitigation and the message is "you can afford it" because the basic elements of risk reduction are generally affordable.

(*Miss La Trobe*) I just want to say that Tearfund very much think community training in DMP is important and communities can prepare their own response to a disaster if they know how to do that. We have produced some literature. This one is on improving food security but we are producing one at the moment on disaster mitigation and preparedness as a whole. It is very, very simple but it teaches communities the types of measures they need to have in place and how to respond in a disaster because often there may be early warning but if communities do not know what to do when that early warning comes that is when you get trouble. This is very simple but it is actually very effective.

(*Mr Atkins*) On the principle of doing what you can do before trying what you cannot, I think there are a number of international policy processes which could be made much more effective for disaster mitigation and preparedness. I am thinking of the PRSP process, which obviously you are aware of, and I am thinking of the World Summit coming up. These are opportunities, pegs if you want, to raise not just local awareness but national government awareness, international awareness, and I think it would be a shame if we missed those opportunities. If the Committee thinks it is worthwhile I would like to appeal that there be a stronger emphasis perhaps of the British Government as we approach the World Summit on the issue of disaster mitigation and preparedness and also a greater influence brought to bear on national PRSPs. This is a tricky one. We have all said we are against conditionality, yet we also have our partners in places like Honduras, Nicaragua, Guatemala, saying "we went along to the PRSP process consultation, we put forward our proposals on mitigation and none of it appeared in the plan". There is a job to be done, if you like, in encouraging national governments to really listen to what some of their own people and the civil society are saying about mitigation and to take that seriously. I think we can support that process through saying those things, where appropriate, around PRSPs. The last thing I would say, and it applies to the earlier question of is it climate change or other things causing the problems we are seeing, to a degree it does not matter too much because what needs to be done is the same thing whatever the cause. Whether it is climate change or not, do not cut your forests down. Whether it is climate change or not, you need better management of your water. In a sense, we are saying we just need more of the same but we need it much faster and much bigger because climate change is going to make it all much worse, in crude terms. It is not big, new ideas, it is stuff people have been saying for a long time and it just now needs to happen.

(*Ms Helmer*) One of the things that I find so fascinating in dealing with climate change from a development and humanitarian perspective is the chain of different actors and expertise dealing with it and the different cultures behind it and that is what complicates matters so much. I have seen a similar chain dealing with the weather forecast—information of satellites, of changes in weather patterns and how to bring this information down to community level and where the weakest link in the chain is. A met service official would look at that chain totally different from a community based development officer and they still do not know how to communicate with each other because the met service would say "we need more data" meaning to say he will look for the solution in his own sphere of capacities. That is one of the key problems we are dealing with linking climate change with humanitarian development issues, that in our complicated society we are not used to looking over the bridge and looking at the capacities of others, we still tend to find solutions in what we are good at, whether you are a met service man, a disaster study specialist or a community development person. That is one of the problems we have to deal with. Sometimes it is cheaper to hide behind your models of what climate change might do to a region than go out on the ground and see what priorities communities have. If we strive to make that link, that is where we can make the progress.

Mr Walter

146. I would like to come back to the relationship between local and external relief efforts. We have touched on this several times and we have had the very good example of Mozambique and the effectiveness of the local effort rather than the external effort saving people. I think there is some evidence that the external relief assistance often creates parallel structures to the local initiatives, particularly in the provision of health care, of field hospitals, supply of pharmaceuticals and so on, with the result that the local community structures are probably left weaker and perhaps more vulnerable afterwards. Would you like to give your thoughts on how donors can ensure that their relief efforts do not undermine the local disaster preparation and mitigation efforts? Have you got any examples of donors actually strengthening local organisations and structures and then working through them when disasters strike?

[**Mr Walter** *Cont*]

(*Ms Helmer*) Talking from our own experience, we have capacities at local level with our volunteer organisations there. It is crucial that the local organisations are involved in the programmes. I do not know how to say more on that. This is how we always go through national societies and call in expertise from our worldwide network at their request. Maybe Jonathan can say more about that.

(*Mr Walter*) To answer your first point about how international donors could avoid undermining local capacities, I think there is a tendency which continues, which has been highlighted in the DEC evaluation of the British agencies' response to the Gujarat earthquake, that external supplies, external consultants and experts continue to be flown into disaster zones and in many cases in India, for example, local materials, local contractors, local business should be and can be supported more with money from international sources and that would strengthen the indigenous capacity to respond next time. If you keep flying in experts, consultants and materials you are wasting money and you are undermining the local markets. I think one sort of concrete tangible aim which the Committee might consider looking at is to set local procurement targets so that you might have an aim to buy ten per cent or 20 per cent of the materials and labour required for any particular disaster response at the local level so that not only are people's livelihoods enhanced immediately during the recovery phase but also so that their capacity is left slightly stronger for the next disaster.

(*Mr Atkins*) I think we can see a trend happening within the relief agencies, and bear in mind Tearfund does both long-term development and short-term emergency relief. The trend over the last few years has been, where possible, to work with local partners in doing the relief work as well as the long-term development. I think that is beginning to happen elsewhere as well so the first response is not "Can we fly in a team?" but rather "Who do we already know on the ground who we could help to respond to this?" In recent cases, we did not send a team to Honduras in Hurricane Mitch, we worked entirely through local partners. In the recent earthquake in El Salvador, a couple of years later, exactly the same. In Gujarat we sent out a team to advise local partners, but pulled them out when they were no longer needed. We see that trend happening. What we need to be aware of though, is that in some circumstances, and maybe they are becoming increasingly rare, because of the nature of a catastrophe or a conflict, say if it is an ethnic conflict, all of the people you might otherwise have worked through have actually had to leave or been destroyed or whatever. In those cases you face a very stark choice: do you go in with your own people or do you stay out and not contribute? It is a genuine dilemma. I think the long-term aim has to be if you must go in and if there is nobody you can work through locally at least to build up the capacity of people while you are there so that when your ex-pat or whatever team withdraws, there is local capacity in place for the future. Those are difficult operational decisions sometimes.

(*Professor Davis*) Just to comment on this issue. I remember a minister in India who was responsible for disaster planning once said to me "What skills do you have in the UK and what materials do you have in the UK to help in disasters which we have not got in our country?" and I said "I do not think any". So he said "Why do you people keep on coming and why do you keep on sending stuff? When we ask for money you send stuff". I said "Perhaps it is due to the dynamics of our agencies which may be able to locate materials faster through their UK stockpiles than they might for local purchase". He said "I think we have got to put a stop to this because we could be stimulating local commerce by local purchase. Cash really is highly effective". He also spoke about the growing strength of Indian consultants who can do excellent work. I feel that in coming years there will be a revolution in this area with fewer flights going off from Stansted at night laden up with disaster assistance if local stockists can be built into the equation. One of the useful things which could happen is in these highly disaster prone areas is there could be a study of local resources available there and the agencies will not, therefore, need to spend a huge amount of money, and DFID also, in funding these very expensive flights to send materials. On the subject of personnel, I remember spending two weeks with an unnamed agency in a training course on disaster planning and this agency sends its teams in even if there is no local counterpart, and they have done that as a matter of policy for many years. There was hardly any mention of government in the entire two week workshop. I recall in my summing up I said "There has been a missing discussion here and that is your relationship with the host government" and the agency's staff responded "Well, that is because we have no contact with them. We arrive, we set up shop, we distribute aid and we go". So immediately all the resource team said "And what then will happen following all your efforts?—where are the stakeholders to maintain this?" There was very little concern on their part on this issue. In India, China, the Philippines, Latin America, and South Asia, such strong capacity has developed that there is now a very different pattern than in so many African countries. Gradually there is going to be a declining role for British expertise and a declining role for British products. Perhaps the British expertise will be more involved in training and capacity building to strengthen local capacities. It is here that the shift will occur. Your question is a very good one because there are these paradigm shifts which are going to have to happen. They should have happened a long time ago. They have also got to happen in the policies of DFID in terms of responding to these events and how to strengthen local capacity when they really have a tremendous opportunity to do it, but of course there will have to be pre-planning for that to happen.

147. Is it not a dilemma sometimes, particularly for food aid going in? Yes, of course you do not want to undermine local agriculture but on the other hand there are thousands of starving people. How do you resolve that?

(*Professor Davis*) By very effective needs assessments. The assessments of needs will have to happen before anything is sent and Clare Short has been quite right to emphasise "we are not sending anything until there has been an accurate local assessment undertaken". The assessment is crucial. It has got to be accurate and it has got to be endorsed and ratified. Of course, a group like DFID are getting

[Mr Walter *Cont*]

assessments coming in from all directions and they can quickly work out the overall picture. If the assessments are accurate there is less opportunity for that kind of problem to occur. The assessment would also take into account local capacities and what damage dumping a lot of food aid might do to local stockists, local suppliers, retail outlets and so on.

Mr Battle

148. Can I follow that through with one particular question. Are there any plans for disaster mitigation and preparedness to be included in the National Action Plans for Adaptation?

(*Professor Davis*) Could you clarify National Action Plans? Are you talking about adaptation to climate change?

Mr Battle: Yes.

(*Professor Davis*) In reading the material for this Committee and studying the evidence so far I suspect that there is a need to synchronise that whole process. I would like to know a lot more about how those adaptive plans can synchronise with this process. I did not see enough evidence that it had happened. That seemed to be yet another area of development which was going on parallel railway lines without key links being made. Adaptive behaviour which is referred to must include all these coping strategies and mechanisms and they have got to become one process.

(*Ms Helmer*) One of the worries I have about the negotiation of national adaptation programmes which started under COP7 for the LDC fund, is that too much time is going into negotiations at global UN level. I think some countries, like the UK and a few others, could start to make the trend at a lower, bilateral level to develop the ideas of what a national adaptation programme should and should not be and then put it into the argument. It would be better if we had more cases that could be brought into that debate. I totally agree with what Professor Davis is saying, that from the disaster management perspective there is a lot of experience that could be brought into it which is not happening at the moment.

Mr Colman

149. The Committee is going to Ghana and Nigeria in early March and it would be very useful if you are able to give us any evidence of what is happening in terms of those two countries' National Action Plans for Adaptation in terms of dealing with disaster mitigation and preparedness. I am thinking particularly in terms of the south of the country as I think you said 60 strategies over the last period and you were quite critical of them. If it is possible, if necessary on a confidential basis, to provide us with information, any of you, on the situation there and the PRSP as well that would be very helpful.

(*Mr Atkins*) If I can just make a point about that, about the number of different strategies that there are. Something we are hearing from our partners is that they are being consulted to death as members of civil society on one strategy after another. It is good that they are being consulted, but many of these strategies should be one and the same strategy. It is not a new thought to you and I know DFID has been doing some good work on how PRSPs, National Strategies for Sustainable Development, should actually be coherent. I think we need a lot more of that.

Chairman: That is a very good point and a good point, I suspect, on which to conclude. Can I thank you very much for coming to give us some excellent really very helpful evidence which has been very much appreciated. Thank you very much for giving us your time this morning.

Supplementary memorandum submitted by Jonathan Walter

One of the Committee members (Ann Clwyd) suggested that, during Mozambique's floods of 2000, (a) if it had not been for the South African helicopters, a lot more lives would have been lost, and (b) co-ordination of the relief effort was poor in the early stages.

No one would disagree that the South African air force saved many Mozambican lives during the floods of 2000. According to Joseph Hanlon and Frances Christie (authors of *Mozambique and the Great Flood of 2000*), South African aircraft saved 14,391 people. However, it should be pointed out that media coverage focused on international helicopter rescues while failing to report that the majority of Mozambicans were saved by local boats—both military and civilian. During the 2000 floods, a total of 29,100 people were saved by local boats, while 16,500 were saved by regional and international aircraft. Hence it makes sense, in terms of building capacity to adapt to climate-change related disasters, to invest more in local, low-cost, life-saving resources which have already proved their worth.

On Ms Clwyd's second point, I would point out that according to Mr Hanlon and Mrs Christie, who were in Mozambique at the time of the floods and who have written a book on the subject, the Mozambican government's coordination of a joint logistics operations centre enabled military aircraft from nine different countries to operate successfully together under civilian command—the first time ever in a natural disaster in Mozambique. According to Hanlon and Christie: "The effect of the coordinated effort was spectacular".

Jonathan Walter, Editor,
World Disasters Report

May 2002

THURSDAY 18 APRIL 2002

Members present:

Tony Baldry, in the Chair

John Barrett
Mr John Battle
Hugh Bayley
Mr Tony Colman
Mr Piara S Khabra
Mr Andrew Robathan
Tony Worthington

Examination of Witnesses

The Rt Hon Clare Short, a Member of the House, Secretary of State for International Development, examined, and Mr Richard Manning, Director-General, Resources, and Mr Adrian Davis, Head, Environment Policy Department, Department for International Development, further examined.

Chairman

150. Secretary of State, thank you very much for coming. Colleagues have promised that they will ask brisk questions so we can try and encapsulate this in about an hour, if that is convenient to you. As you know, we have been undertaking an inquiry into climate change and sustainable development. I think we would be interested if you would like to tell us what, from DFID's perspectives, are your priorities for the Johannesburg Conference? I am not sure whether you are going, I am sure you are, but what are DFID's objectives at that meeting?

(*Clare Short*) I just wanted to say I have had this long letter about your visit to Ghana and Nigeria, for which I am grateful. It was handed to me when—

Chairman: That was a report.

(*Clare Short*) A report on your visit.

Chairman: We are not expecting an instant response.

(*Clare Short*) The thing is, I have not even read it yet. They literally gave it to me. The point is there might well be information in there that having sent the letter you think I have but I have not actually read it yet. I just want you to know that I do not have that information. The second thing I would say on climate change is I do not consider myself at all an expert on climate change, there are people in the Department who follow that agenda carefully and think about the effect on developing countries. The basic point about it is the world is being polluted and the climate change is being generated by countries like ours and the likely effect on developing countries is in the increasing turbulence and instability. We are focused on that end of the discussion although, of course, the Department has experts and expertise helping developing countries look at the likely consequence for them but we are not central players in that debate because our countries, so to speak, are going to be recipients of the turbulence although, of course, later on South Africa, Brazil, China and India as they start to develop and affect the rest will be players as well as recipients. The third thing on WSSD is I think there is an enormous prize to be had out of this UN Conference. We have been trying to work as a Department to not have these one-off UN Conferences all over the place about whatever the latest fashion is but to hone an ever growing consensus in the international system. First the Millennium Development Goals, which as you know we worked to get agreement right across the system at the Millennium Summit, then Doha on trade, a commitment to looking at trade again to grow developing countries, then Monterrey, and it is not just money at Monterrey, it is how do you finance development, what kind of reform grows an economy, creates more revenues, better livelihoods and funding for public services and the proper and better use of aid. The Millennium Conference, Doha and Monterrey have gone well, and then Johannesburg. The prize, if we can get it, is the Northern Greens who tend to often adopt an anti-development perspective, because living in our privileged countries one thinks "the planet is under strain, it cannot take any more pollution or use of its natural resources, we should all stop being so materialistic, not go for growth and diminish world trade". That perspective comes out of a genuine good-hearted concern for the planet but leaves out the needs of the poorest people and countries to have economic growth and more material well-being. So you often get, and it certainly happened at Seattle and it bubbles up in different meetings that we go to, the Green agenda being anti-development and being seen as hostile by developing countries, that we polluted the planet and plundered it to get our development and now we are pulling up the ladder behind us with a set of rules that will make it very difficult for developing countries to grow. They are very conscious of that and the threat at Seattle, for example, to put environmental rules into world trade rules could lock them out of the possibilities of growing their economies through trade. The bad thing about that is, one, it is unfair to developing countries to create such rules that prevent them developing but, two, the world will divide in two. We cannot look after the planet sustainably unless we are looking at it in a way where we all stand to gain mutually and where there is something in it for everybody. Therefore, to have a real environmental sustainability agenda we have got to get the Greens to join up with the development people, to see that what we have got to have is a guarantee to development for the poor countries and poor people within a sustainable planet. That is a shift in the mind set of the environmental movement that I think we might achieve at Johannesburg. If so, then the international consensus is stronger, what we have to

[**Chairman** *Cont*]

do is clearer, getting on with implementing the consensus is better. Of course, for developing countries that means grow your economy, better social provision and look at your own environmental resources. That is what sustainability means. Personally I think that is the prize for Johannesburg, this shift in the mind set, a guarantee of development for the poor with a commitment from all of us to work for a sustainable planet and to take it away from the conservation, do no harm, have lots and lots of checks on any development proposal because it might be harmful for the environment. Promoting development is part of making the world safe and secure and the levels of poverty we have are a threat to the future safety and sustainability of the world. I think it is edging our way. I think it is a very important prize because lots of the negatives and the NGOs and people on the street, lots of well meaning people, come with this almost anti-development mind set but think they are being kind and it does get in the way of international agreement and just driving forward development and implementing the agreements we have got.

151. I am sure you are right but having read a fairly excoriating article by George Monbiot in *The Guardian*, for example, it seems to me if that is the case we are going to need to spend some time between now and September improving the vocabulary at home so there are not all those misunderstandings about what people are actually saying. It seems to me that it is just a misunderstanding of what certain words mean.

(*Clare Short*) I would just like to say sometimes people have names that make you think of things, like Mr Fukuyama with the end of history, and Mr Monbiot also makes me think of things. He is an intransigent—I have seen an article by him, I do not read him any more, saying that the free market used to be okay when it was a baker's shop at the bottom of the road but now it is multinational capital it is hopeless. These are people indulging in all the privileges of living in a developed economy, having clean water, sanitation, electricity, telecommunications, access to the internet, walking up and down shopping streets buying the products of multinational capital and then getting themselves into a frenzy that it is destroying the earth and becoming absolutely fixated on not letting any of this get to the developing world. It is a series of errors, some of it genuinely held, some of it just people who like spreading enmity and hostility and misinformation. Some you can win, some you cannot.

Mr Battle

152. While sharing some of your reservations about the proper integration of sustainability and poverty eradication, that was not a common agenda in the past, it was almost the environmental movement sometimes felt that the people were the problem and setting the environment against the people. I think it has moved on. Some of us visited Northern Nigeria and I was very shocked in Northern Nigeria literally to see the—big word—desertification, to see the desert blowing in where rivers were dry and people were trying to scratch a living in practically pre-biblical conditions without even Jacob's well there. I just wonder if you can get in your vision of it that integration of environment and poverty eradication as a common vocabulary at the Summit. Can the Summit do more than just be a talking shop? What kind of outcomes would you like to see from the Summit to take it further forward? What I would not like to see is everyone has got together but nothing happens as a result of it.

(*Clare Short*) Let me come back to desertification in Northern Nigeria. It used to be the case, but it has improved in recent years, that Summits and UN Conferences were places for grand declarations of moral principle and concern about poverty and the rest and then everyone went home and carried on as before and there was fantastically little in concept that meant it had to be implemented. You had one on children, one on deserts, one on forests, the fashions change and everyone turns up and has another jamboree. That was how the system used to be. The International Development Targets drawn out of the series of Summits on children, women, reproductive health care and so on and then driving them through the IMF, the World Bank, the OECD into the Millennium Development Goals and then Doha getting serious about trade and Monterrey getting serious about how to manage the world economy in a way that will give the poorest people in countries a real chance of development within a sustainable framework is the bit that needs to become entrenched in the international consensus at Johannesburg. When you come to individual developing countries there are two takes on the environmental agenda. The poor of the world, the rural poor, are more dependent on environmental resources than any of the rest of us and very directly that land, that wood for their cooking, that fish that they can get, the products of the forest, so as you get the forests chopped down, and there is enormous corruption in forestry and people who own the forests. They take the animals, they take the trees, and the people who have lived for generation upon generation in the forest have more and more difficulty. Of course, we have got growth in world population and deforestation and so on, more grazing, more animals, more desertification, people who live on the food they grow themselves and as the land gets poor their children go hungry. This is spreading around the world. A part of the answer is better environmental management. What we have learned about forestry, for example, is you have to give the people who live in and around the forest and off the products of the forest—and that is never just the trees, there are all sorts of other plants, where their animals feed and so on—some control over the future of the forest and then they will nurture it and care for it. There is that famous thing, you plant trees for your grandchildren. The poor of the world have tended not to have any control over the forests they have lived in forever. You need that kind of environmental improvement and the same with fisheries. We have got a big project in West Africa for fisheries. The European fishing policy is in danger of denuding Africa of its fisheries just like we have done to our own North Sea. That needs dealing with and stopping because there are lots of little people who fish and that is how they get their protein. If the fisheries go, they go forever. Within the country you need to look for your

[**Mr Battle** *Cont*]

strategy for economic development and the reduction of poverty but include sustainable management of environmental resources in a way that is pro-poor and gives the poor some say over their future and therefore some interest in nurturing that but given the scale of world population we are going to need more value added. Urbanisation is happening anyway, half of humanity is now urbanised, it is going to be 65 per cent in another 15 or 20 years. There has got to be more processing of agricultural projects, more value added, more people getting jobs, not just in the forest or by growing food because the world cannot sustain it. Some of those people in Northern Nigeria might urbanise and have better jobs processing some of their products and then you need a change in trade rules because Africa exports unprocessed products. Then, of course, all of these poor countries are going to have more and more turbulence in their environment, more and more disasters, floods, and climate change that means the crops do not grow because of what we are doing to generate global warming. That is even more of a burden on them to be able to promote their development and improve their lives. We need the international agreements that deal with some of that destructive effect, we need much more promotion of development, and in a lot of countries, because we cannot stop some of this turbulence that is coming, we need to help countries to have in place the capacity to deal with crises. There is the famous thing, you have floods in the southern United States of America and a few people lose their cars; you have them in Mozambique—it used to be Bangladesh but Bangladesh has learned—thousands of people lose their lives. Part of dealing with catastrophes is to be prepared and organised to deal with them. That is my answer to your question. This is fantastically urgent both in terms of human need and in terms of the urbanised, very unjust world where now because of the global communications we have the poor of the world see how the rest of us live and they are not going to be dispersed across rural areas, they are going to be collected together in cities more and more. The anger and rage there is going to be if there is not progress is going to make for a very bitter, nasty world. It will make where we are now, which is pretty depressing, even more depressing.

Mr Colman

153. I understand that the Danish Government are promoting the concept of a global deal in Johannesburg. What do you believe is the global deal and are you backing it?

(*Clare Short*) The Danes are talking about it and the South Africans were talking about it. Are they talking about it less?

(*Mr Davis*) They are talking about a programme of action.

(*Clare Short*) It sounds nice, a global deal. People who came to this not having focused on the Millennium Development Assembly, Doha and the rest came afresh as though we had not had the preceding conferences and then said "oh, can we have a big global deal for sustainability for the world?" I gather the Danes are saying free trade, international environment agreements, development of the 0.7 per cent ODA target strengthening freedom and democracy. That is fine. I do not think there is going to be a global deal. I think it is a programme of action that drives forward what we have agreed at these other conferences that is leading to implementation that brings sustainability and environmental resources into the picture and gets the mind set of the world right about how to care for them.

154. I understand some environment groups are concerned about the agenda that Denmark are pushing in this global deal, which is very much around a free trade agenda, environmental and social concerns, and they are concerned that the vested trade concerns will override environmental and social concerns.

(*Clare Short*) There you are, that is an example of the backward anti-development environmental movement. I just said about Africa. Seventy-plus per cent of its exports are unprocessed commodities coming out at tiny prices, their cocoa, their coffee, their cashews, their minerals. It is a resource rich country but—Then, of course, of the packet of cashews we buy a tiny, tiny fraction goes to the farmer who grew the cashews. They need the jobs to package it, they need the jobs to package the coffee or whatever it is and, as you know, commodity prices are falling. If there is not a change in world trade rules giving the poorest countries the chance to process, add value and export and, therefore, be able to afford the imports that give them access to modern technology, that gives them water, sanitation and so on, then those who argue this, if they were to succeed, are marginalising the poorest countries forever from the globalising world economy, from modern technology, from the chances for investment and sentencing them to every growing poverty, because it is not a stable thing. In poor countries the population is growing. In Africa the population is growing faster than the economy and on present trends Africa is going to get poorer and poorer. Those who think that giving Africa more chance to trade will somehow endanger the environment, if they were to succeed the consequence for Africa would be disaster and they are profoundly wrong.

Mr Khabra

155. Many people in the world consider that the World Summit on Sustainable Development is the last chance to push for ratification of the Kyoto Protocol. It is worth noting that it would leave many of the concerns of developing countries unresolved. In view of this may I ask you a question. How has climate change featured in the discussions building up to the Johannesburg Summit and what does DFID hope will be achieved on climate change at the Summit? What prominence will climate change issues have at Johannesburg?

(*Clare Short*) We do not agree, and the South Africans do not agree and the international system does not agree. Kyoto, as you know, is profoundly important but also divisive. We have got the biggest economy in the world not co-operating and we have got some other big OECD economies that have not decided whether they will or not: Japan, Australia, Canada and so on. If there is any attempt to bring

[**Mr Khabra** *Cont*]

Kyoto to Johannesburg it will divide the Conference, the thing will be a disaster. We have got another process for Kyoto, which is delicate and precious and needs protecting and needs not to be taken to Johannesburg. It will damage Kyoto and it will destroy the Johannesburg Conference and some of the big players who have not decided what to do about Kyoto would probably not come. I understand why people think this is a conference about the environment and we have not resolved Kyoto, let us take it there, but it is extremely unwise and we must not do it. It would be a disaster. Your second question was what are DFID doing. I tried to indicate earlier that the people who are causing climate change are our kind of economies and it is us who have got to clean ourselves up. The poorest economies are going to be the recipients of even more barriers to their development out of the turbulence, the disease spread, the effect on crops and agriculture, the disasters, the flooding and so on. Part of our take is them preparing, understanding, getting some knowledge of what is likely to come to be better at handling the consequences. There is a series of big countries that will as they develop, and China continues to develop very successfully, I see despite the world economy going down they had ten per cent economic growth again this year, they will start as they go on—India, China, Brazil and South Africa—to later become countries that will need to join in the agreement to reduce emissions. China has done remarkably. It got quite worried about its own environmental damage. Its economy has been growing considerably, ten per cent a year for ten years or more.

(*Mr Davis*) Twenty, since 1980.

(*Clare Short*) The most successful poverty reduction that is going on in big numbers is in China. They also adopted major reforms on energy and they have reduced their emissions while they have been engaging in this kind of economic growth. There is a series of very important lessons there. For the poorest economies, on their potential contribution, even the most successful possible development you can think of for them, they are not going to be real contributors to global warming, they are going to be recipients of the effect. I do not know, Adrian or Richard, if you want to add anything on what DFID are doing. I hope I have made clear how we come into this. It is not our core issue but it has a deep consequence for the countries we are interested in, so we do take an interest. The main players are us, the polluters, the OECD countries, which we do not lean on.

(*Mr Davis*) Only to confirm that the main area in which we will be working is adaptation to climate change. As we made clear at the first session when we gave evidence, the more development there is in an economy, the more resilient they become to climate change, so we will be concentrating on adaptation. I suspect there may be questions subsequently specifically on adaptation.

156. I am going to ask you about some controversial issues. I consider that developing countries, the poor countries, have not got the same capacity to follow the Kyoto Protocol whereas the highly industrialised rich countries have had years of opportunity to develop and have been able to reduce poverty. Countries like India and many other countries are not in the same category at all. In trying to reach a global deal, can the Johannesburg Summit bridge the different perceptions of climate change between the North, where it is seen as a pollution and environmental protection problem, and the South, where it is seen as an issue of livelihoods and survival? I can give you the example of the Narmada Project in India which will bring enormous benefit to the poor people but the environmentalist lobby which have imported anti-developmentalist environmentalist lobbyists are going mad to oppose it.

(*Clare Short*) Andhra Pradesh?

157. The Narmada Project. Can the distortion in climate change negotiations caused by the dominant Northern perception of climate change as an environmental problem be overcome and a more equitable and inclusive way forward be found to help countries like India, Pakistan and some of the other countries?

(*Clare Short*) Firstly, climate change is not and must not go to Johannesburg. We must not go there as a first base. Of course, the Kyoto Protocol does not require developing countries to reduce their emissions. This is the thing that the United States finds objectionable and thinks that it should, but we agree with the Kyoto Protocol that we are the mega polluters, that we move first and then, of course, this should be going on later and as some of the big developing countries develop, like China, they will join in later with some kind of agreement. I agree with your fundamental point, it would be absolutely wrong at this stage to impose requirements on reducing emissions on developing countries that are producing very few emissions and have weakness of capacity. As their economies grow they need to come in but be helped in the meantime to grow their economies with sources of energy that are not polluting. China is an example of making a lot of progress. As they have grown their economy they have improved the cleanness of the energy that they have been using. I do not know about that particular project in India that you referred to but Richard Manning does. Let me say about India that India has masses of capacity, it has enormously strong educated people but it also has a third of the poor of the world, and that capacity it has is not always applied consistently right through society to bring the reforms that would bring the benefits to everyone. That is the challenge for India. This is another example of Northern concepts of the Green agenda objecting to development. We have got this row on at the moment about Andhra Pradesh. Andhra Pradesh has got 160 million people, very, very poor people, a very powerful reform agenda trying to grow the economy, get all children educated. It is progressing, it is breaking through caste boundaries. I have been to a tribal village where there was not a single literate woman but every single little girl is in school. Those are the sorts of things being achieved in Andhra Pradesh that are deeply moving, and the sorts of things we need to achieve across the world. We, as a Department, have put 60 million in budgetary aid to back all of this reform agenda in Andhra Pradesh. There is a lot of landless poor. Thinking about the future of the economy, there are projections by the government of Andhra

[**Mr Khabra** *Cont*]
Pradesh about how less people will live on the land and how the land might be more productive and more value added. I think they are open to the use of GM. Suddenly we have got vicious campaigns against my Department saying we are responsible for all of this and we have got to stop Andhra Pradesh doing all of this, which is not our right, it is for the people there and their own elected government to make this decision. It is another example of a well meaning, I am sure, but distorted version of the environmental agenda having a naivety about what has to be achieved in order to promote development in poor countries. Before the Industrial Revolution 98 per cent of the population of Britain lived in poverty in rural areas and that was at the time when you got hanged for stealing a sheep, and people did because that is how hungry they were. That was why they came into the cities and lived in squalor and then we had the political struggle to use the benefits of industrialisation to lift up everybody. There is a whole mind set there that seems not to remember that history and thinks it is a great romance for everyone to live in rural poverty. Sorry.

Chairman

158. We are going to move on from Johannesburg to specific questions about climate change but, before we do, this rather excellent report that our colleagues on the Environmental Audit Committee did on sustainable development[1] refers to some work that DFID has done with the World Bank, EU and UN on linking poverty reduction and environmental management. They referred to a consultation draft in January. I just wondered whether that has come to a final document yet and, if so, whether it would be possible to share it with us some time?

(*Clare Short*) Yes, indeed. That project was about this very discussion, can we get the environmental agenda really to be about sustainability and be development friendly. We joined together with those organisations to try and hone a forward looking agenda that takes account of the needs and interests of developing countries. We did a consultation phase, the consultation is now complete and it is—

(*Mr Davis*) Not yet. We sent you the first draft. We sent 15 copies, it is the blue document . We sent that to you as part of the papers that we promised to send you after the first session.

Chairman: Yes, I remember.

(*Mr Davis*) There has been an electronic discussion group. We are revising it and setting out an action plan summary for the Bali Preparatory Committee and then the final report will be available about a month before Johannesburg [2]. Incidentally, because that has been so successful we are doing a joint paper on climate change and poverty now.

Chairman: I think we would be very interested to see a copy of the final draft.[3]

(*Mr Davis*) Sure.

(*Clare Short*) We are trying to parallel the preparatory process with a more intelligent discussion of how you can bring sustainability, environment and development for the poor together.

Chairman: I suspect we all concur with that, it would be useful to see the work that has been done.

Hugh Bayley

159. What assessment has your Department made of the impact of climate change on the achievability of the Millennium Development Goals? For instance, we have received evidence saying that climate change will lead to a greater geographical distribution of malaria, and depletion of water resources. One goal is to stabilise and reduce the incidence of malaria, and another is to ensure that there is an increase in the number of people who have access to safe water supplies, so climate change will make those Development Goals harder to achieve. How much harder?

(*Clare Short*) Indeed so. I will bring Adrian in. A piece of very serious work has been commissioned to answer that question. Have they had that too?

(*Mr Davis*) No.

(*Clare Short*) I will leave that with you and we can send you some more copies[4]. There is also some work we are doing now to help countries to look at what the knowledge is that we have now. We have got to remember that the projections of climate change from now assume the world does nothing to deal with it. As you know, lots of Pacific and Caribbean islands and countries would disappear, a third, a half of Bangladesh's territory would disappear yet it is highly crowded and it is going to double in population because although population growth is declining it is a very young country. The long-term projection is horrendous but what we have got to do with that projection is learn that we must not go there. That is why we need Kyoto and we need to change the behaviour of the world and reduce the prospects of that very grave climate change but some effect is inevitable already and that will bring damage, increased turbulence, more floods, more disease and it will add to the burdens and problems of meeting the Millennium Development Goals. We have to face it and do better, and we can do better if the world would just concentrate and apply everything we know more effectively throughout the international system.

160. That is an optimistic view but to continue to be the pessimist, achieving some of the goals will be likely to accelerate the problems of climate change, for instance achieving the trade goals, or maybe achieving other Millennium Development Goals. Have you equally made an impact assessment of whether the achievement of some of the goals will accelerate climate change?

(*Clare Short*) I think that is profoundly wrong. If you look at economies like ours with the kind of level of economic development and technological capacity we have, we have the capacity to treat our environment with more and more respect, not pollute it, reduce emissions, have forms of energy that do not create climate change. It is when you are more

---

[1] Environmental Audit Committee, Third Report of Session 2001–02, *UK Preparations for The World Summit on Sustainable Development. (HC 616).*

[2] This will be published in a final form in late July. A copy of the summary has been placed in the Library.

[3] Not printed. Copy place in the Library

[4] See *http://www.erm.com/climate&poverty.*

[**Hugh Bayley** *Cont*]

developed that you can afford to adapt your technologies and make the changes to protect environmental consequences. Very poor countries just do not have the capacity. The massive burden of disease in the world is human beings relying on wood for cooking and we have terrible respiratory diseases and lots of people get ill and children die because of that. They have no option, there is no electricity near them, let alone renewables. They have got to grow their economies and they need better trading opportunities to grow their economies to be able to afford to have some access to energy and then go for the China route of going for less polluting energy and so on and so forth. It is absolutely wrong to suggest that more trading opportunities for poor countries leads to more pollution, that is just false. That route lies a divided, polluted world in deep, deep trouble. Humanity is urbanising. Look at us in this urban country. I talked about where we were before the Industrial Revolution. Human beings all over this planet are choosing to go and live in squalor and poverty in some of those slums that we see. When you see those slums you have to know how hard their life must have been in the rural area to go and live there. The rural always looks beautiful, green, and there are the rivers, but people migrate to the city just to get some fraction of a chance, a few breadcrumbs of a chance, of a better life. Humanity is making these choices. It is more than 50 per cent now and we are going to 65 per cent so we have to share our technology, access to clean water, sanitation systems and so on in order that we can have responsible sustainable development and back the choices that human beings are making. I cannot stand the green agenda that says poor people cannot have better trading opportunities and that Africa cannot process its products and that poor people are not allowed to urbanise and aspire to have the things we have. That is profoundly reactionary. Some people innocently come to it, and then there is Mr Monbiot

161. To move beyond Mr Monbiot on that, do you see a difference, Secretary of State, between the green agenda in the north and the green agenda in the south? One of the things which struck me forcibly in Ghana was that as soon as we left Accra and started heading north we saw a line of lorries each loaded to the top with tropical logs heading south to Accra, lorry after lorry after lorry. One of the projects we met, which your Department supports, was a project to grow seedlings for depleted forests. How do you bring the environmentalists in the south together with the development experts in the south together with the climate scientists in the south to get them developing an agenda which is good for poverty relief and good environmentally?

(*Clare Short*) There are some differences and there are some things that are the same for the greens in the north and in the south. The responsibility to deal with the emissions that are causing global warming lies in the north and the south is the recipient of the consequences, that is clear. Developing our economies sustainably is a duty in all our countries, but the stress on rapid economic grow in order to reduce poverty and transferring access to modern technology to do it as cleanly as possible is complementary but slightly different because the starting point is different. The urgency to get growth to reduce poverty is much greater in the poorest countries. Let me say on lorries and logs, there is nothing wrong with using forests as long as you are doing it sustainably. This country used to be covered in forests. We destroyed our forests. Of course forests are being destroyed in other parts of the world. Sustainable forestry is about those people living in the forests having some control over the future of the forest and being able to get some money from responsibly using the fruits of the forest, and that will include logging and selling wood, but not so fast that the forest cannot replenish itself. We have got lots of wooden things and wood is lovely and as long as we are using our forests in a sustainable way the countries that still have forest will export logs. That is fine. The Department has been doing some work on how you bring all the expertise together. Adrian?

(*Mr Davis*) Can I say that increasing public awareness of the environmental issues in the south is very important because demand from the people is one of the factors that will start to get governments aware of the need for an integrated environment, not just in climate change but integrated environmental strategies. We have been doing that in Kenya in particular. There is an environmental governance programme in Kenya which is not centred on the government but is centred on civil society to get them to demand that, for example, logging or corruption which leads to environmental degradation is taken more seriously by the government. Also, if you build that kind of bedrock, it gets away from the relatively short-term political horizon of governments to get them to take into account these longer-term environmental issues. I visited Bolivia where there is a Ministry of Sustainable Development and there is a Minister of Environment. She has been in the position for ten years and Bolivia has lots of laws and lots of regulation but they are not very well enforced. When I asked her what was the one thing that would enable her to do her job better she said, "Increasing public awareness of environmental issues and then I can put my message within the government and within the country more generally."

(*Clare Short*) Hold on, the stuff about bringing people together that you are working on. A lot of the people who live in the forests or who are reliant on natural resources know very well what is going on and they probably value and care for nature and natural resources more than anyone. That is their life and has been for generation after generation. All over the world where we work in forestry there is massive corruption—in Indonesia with the military, Malaysian companies, in the Cameroons there is corruption destroying loads of forests, in Nepal it is the same. Yes, you have got to use the strength of public opinion to demand the reform that stops the corruption that allows the resources to be managed in a way that enables the poor people to have a better life. Poor people tend to respect and care about the environment but are powerless to stop the way it is all being stripped away from them. 62 per cent of humanity is now under democratic systems, more than we have ever had in human history. Often they are very dominated by elites. Poor people do not feel they can use their democratic power. They do not have the knowledge and the confidence there is lots of bribery and corruption and hand outs. So it is strengthening the voice that demands responsible

[**Hugh Bayley** *Cont*]

management rather than teaching the poor to care about nature. They probably care about it more than any of us.

Mr Robathan: I would like to add I agree that what we saw in Ghana was very definitely over-exploitation and, indeed, your Department is doing excellent work to try and assist the Forest Service in Ghana in trying to stop illegal exploitation. It was fuelled by corruption, it was accompanied by intimidation, so we were told (I have to say we did not see that) and indeed the forced displacement of people who had lived on the forest. We went to a forest reserve where there were no long-standing trees, it was all shrub, the whole thing had been cut down. I am reinforcing what you said.

Mr Colman

162. I was thinking of the conundrum that we saw in Ghana which was that the excellent bridges and roads we were helping to build in Western Ghana which were giving access to schools and access to hospitals were also being used by the logging trucks which they had not been built to take and people were concerned as to how the bridges were going to take the very high weights that were going across them. It is important to combine the development goals of education and health alongside the trade goals and manage them together. My question was not directly about that. It is really in terms of coming back to the broader aspects of the national action plans for adaptation. We are all concerned that this is not moving ahead fast enough in terms of building policy coherence and mainstream climate change considerations in developing countries, but to what extent have these national action plans been reflected in terms of country level programmes that DFID is doing? How do you ensure that managers within each country take account of concerns about climate change. Ghana at the moment is administered from London and is going to be local shortly but India is local. How do you ensure that the country level programmes take account of the concerns about climate change?

(*Clare Short*) We have moved on this. One of the international development targets that came out of the 1990s UN conferences was that every country should have a national strategy for sustainable development in place by—?

(*Mr Davis*) This year.

(*Clare Short*) And under implementation by 2005. We set up a unit in the Department and we are working away at it. What we started getting across the world was everyone had their national strategy for sustainable development on the shelf or in the ministry of sustainable development or environment and the main core of the economy was in the finance ministry and concentrated on the urgency to get economic development. This was to please the UN or the donors. For the Millennium Development Goals, the work we are doing now is taking the poverty reduction strategy, this revolution that has been on the back of debt relief in the way the banks work with developing countries so that the-macro-economic strategy, how you use aid, debt relief, revenues from tax and social spending are all taken together and openly in a country. They are growing urgently all over the world to get debt relief and they need to be lengthened and deepened and they need to take in sustainability. As a country thinks about where it is getting its economic growth, how far it is urbanising, what is happening to its forests, etc, etc, it needs to be integrated in its view of how it is developing itself. We are trying to move, and that is the right thing to do, and it is easy to talk about this. Countries are trying to integrate their trade strategy, and these are countries with frail administrative capacity, as you know, but this is the right way to go. On climate change, again, for developing countries, at this stage they are not contributing to climate change, they are going to be the recipients of more instability, disease and problems with their agriculture as a consequence of that. They need to take that knowledge into their planning for the future of their country and how they are going to deal with the crises and deal with the disease burden and modify their agriculture.

163. Are we leading the way in terms of ensuring that the DFID country planning, if you like, is actually ensuring that the environmental issues are in there? Are we making sure that those who are producing the DFID country plans are building this in?

(*Clare Short*) We are abolishing DFID country plans. When I came in to the Department in 1997, the Department had always had them but we publish them. Then we work very hard to get this poverty reduction strategy where it works and where the country leads and gets the support of the fund for parts of its operation. We and others cluster around the country's own plans for its own development. We focus a lot on building the capacity of the country. You have got enormously weak finance ministries, central banks, education ministries, civil service not paid therefore taking petty bribes and so on, very high inflation, terrible interest rates so no business can flourish, you know you get all of those conditions. Now, taking off a country's poverty reduction strategy, we negotiate with the country how we will contribute to building up their capacity in strength. Yes, then—and Adrian should come in again—we try and strengthen a country's capacity to think about sustainability and their environmental resources alongside how they are growing their economy and how they are improving their public services, the provision of health care and so on.

(*Mr Davis*) I think we said at the first session, we are working broadly at trying to integrate the environment and environmental issues into the PRSP, of which climate change is a subset and probably not actually the most urgent. We are not doing it by ourselves, as the Secretary of State said, we are doing it with a coalition of partners. All of the donors in a country are trying to group around the PRSP so we are working very closely with the World Bank, with other bilaterals. There are competing demands. There is weak capacity. Certainly it is a really important part of our agenda.

(*Clare Short*) Do you want to come in, Richard?

(*Mr Manning*) What we are seeing, I suppose, is a great deal of variability at country level, I think. You have probably already had the example of Uganda where there has been an extremely good exercise to integrate the environmental dimension into their planning. On the other hand, we had a briefing

[**Mr Colman** *Cont*]
session for our senior staff about a month ago from our colleagues in DEFRA and the Hadley Centre about climate change so that we are sensitising our own people better. I was quite interested when my colleague who deals with Asia said that he had been to, I think, half a dozen consultative group meetings on major Asian countries over the previous 18 months and at none of which had climate change been mentioned. That included places like Bangladesh and Nepal where you think they ought seriously to think about it. It is very variable and I think there is an important piece of work to do to get these into the central parts of government. That is why we are putting the emphasis on trying to integrate this into the PRSP rather than having a study on the side. Bangladesh is an example actually where we are working scientist to scientist and institution to institution to try and broaden the awareness. But, on the basis of what my colleague said, this may yet not have percolated to the Ministry of Finance where it does need to percolate because Bangladesh quite clearly will pay a huge number of costs over the next century as a result of this and that needs to start being factored in now.

Tony Worthington

164. Can I talk about disasters and the mitigation of the impact of disasters. It must be so difficult to cope with the short term whilst also trying to improve the long term. Can you give us examples of where in your short term response you have been able to mitigate against a future disaster or lessen the impact of it? The obvious example to me—and I am sure other colleagues—is Bangladesh which you have mentioned earlier and the way in which they coped with a disaster which killed hundreds which meant that when the same climate difficulties occurred the next time there was hardly any loss of life and they were ready to go on. Can you think of other examples like that where you prepared for the future?

(*Clare Short*) People talk about whether there are increased disasters and how far it is already a result of climate change. It is difficult to know, of course, because we are getting such growth of population that people are living on more and more marginal land and so on. The climate change matters enormously but given you have the disasters right now in front of you, we have got to deal with them not just speculate. People see disasters when they hit the media and then there is always the call for international support, quite rightly, but in fact your chances of surviving flooding or mudslides are dependent on the first 24 hours when there is most loss of life. The international community never gets there in that time. What you have got to do is build up the capacity of countries to cope immediately. We have been working with the Red Cross—you know they have organisations throughout the world of locals—to bolster the knowledge and capacity within each country around the world, especially countries which are vulnerable to disaster so there is more and more capacity at home and then with appropriate ministries and so on. Following the Gujarati earthquake we did some follow on work with the Indian Government who have been quite good at disasters but we found some weaknesses in their systems so, where next, India will be able to respond more quickly. We have been working also with OCHA which is the UN agency that is meant to be capable of making the assessment and moving very rapidly and having stocks and supplies around the world which can move in very quickly. The next thing you get is when there is a disaster and it hits the headlines, bits are flying in from all over the world and they get chaos and disorganisation and you need the UN to move in very early to see what the needs are, send for the right things and get some co-ordination so the right things apply. The Red Cross is doing this enormous effort across the world to strengthen the capacity of disaster prone countries to act very quickly. We have been working very strongly with OCHA and then in countries where we are—as in Bangladesh and so on and Mozambique following the floods—to strengthen country's own systems. At the moment the world thinks of disasters in developing countries as a call on international assistance but really that is a failure.

Tony Worthington: That is right.

(*Clare Short*) Wherever possible we build the national capacity. I repeat: there are earthquakes in Japan, there are floods and hurricanes in the United States of America but they have systems and capacity and methods of building where loss of life is virtually unimaginable or very, very rare. Whereas floods, which really should not cause any loss of life, like, was it Colombia, where was it where there were terrible mudslides and very big loss of life—

Mr Battle

165. Venezula.

(*Clare Short*)—you remember, a few years ago, houses were built in inappropriate places, there was no emergency system to pull people out very quickly. Bangladesh is the example, terribly flood prone. It used to lose a lot of life and it has just built up its systems, it cannot stop the floods. It is built on a river delta and people live on lands that move around because there is such a shortage of land. Now the whole country is fantastically good at responding to a disaster and can manage itself and protect human life and we have to build that capacity across the world as well as, of course, helping countries to take the remedial action to try and prevent the disasters. With global warming there is probably a lot which is going to come to them as a consequence of behaviour in the north in polluting the planet and they are just going to have to be better at dealing with disasters and protecting human life and thinking about where to promote development and safer places to build and so on.

(*Mr Davis*) It is interesting, I was talking about environmental integration into PRSPs, the World Bank has done an analysis of this and one of the countries that has integrated the best in their full PRSP is Mozambique because they realise it is really important.

John Barrett

166. You mentioned a lot of the work which has already been done in other countries to collect data on the impact of climate change and move things

[**John Barrett** *Cont*]
forward. Is DFID working to boost the work that has already been done in a large number of developing countries to collect the data that is required to analyse the impact and to start informing the planning process of what is needed to be done in the future so the gathering of the data will be there in some countries. In fact most of the data will be in most developed countries like Japan and the United States. What is DFID doing to collect or to increase the data that is there in developing countries?

(*Clare Short*) What we try to do in everything, as our own development efforts in the United Kingdom and my own Department's efforts mature, is say, "Here we are, we are doing it and build international systems that do it. We have provided funding for the Hadley Centre to prepare a portable, regional climate change model that can be available to countries so that they can look at the likely consequences for themselves and start planning for how they will cope. We have commissioned this very major piece of research that we hope will be a resource for developing countries more broadly. We are trying to work to strengthen the appetite/knowledge of developing countries and our focus is all the time on mitigating effects and helping countries to adapt to cope. You would expect out of this discussion a stronger and stronger voice coming out of developing countries demanding that the world takes firmer action to deal with emissions.

(*Mr Davis*) Collecting statistics is an important area for DFID and developing countries in a whole range of areas because of the importance attached to monitoring, etc. One of the problems with traditional environmental indicators is that they do not address the issue the Secretary of State talked about of sustainability. The number of trees are diminishing, what does that mean? One of the things that we are trying to encourage developing countries to look at is the indicators that link poverty and environment, so that instead of looking at the number of trees when you look at that, you look at the time it takes women to collect fuel wood and whether that is increasing over time, those kind of links. Again statistics on climate change are a subset of that and perhaps it is more important to link the environment and poverty together.

(*Clare Short*) You know how international development is full of statistics and there are books showing how many children there are lots of those figures are very old, very unreliable and if we are to drive the Millennium Development Goals we need better statistics more regularly so you can see which countries are making progress and which are not and policies can learn from success and so on. We are trying with the World Bank the OECD and the UN system to get an improved system of statistics collecting that is not so onerous that developing countries cannot bear the burden. If you look at what the UN system recommends, most developing countries just cannot do that so you have got to both build the capacity and have a limited set of collectable. We have been working on this since Paris 21 a couple of years ago. It needs a bigger push. We are going to have an extra effort so there are more year-on-year statistics of how countries are doing so their own governments can learn and their people can learn and we can learn from where there is a success and where there is a failure. The world is behind on that.

(*Mr Manning*) On climate change statistics in particular we need to remember that there is a huge international effort on this through the Inter-Governmental Panel on Climate Change. There is a lot of use for remote sensing. There is a whole industry which is collecting this data. It is true to say that in some respects the data is better in the north than in the south but we should look particularly at the international process to really good guidance on what is happening in the world as a whole. I do feel that huge progress has been made in the last ten years or so and the latest report is a very important step forward in building the scientific consensus behind what is happening.

167. How does the Department prioritise its actions if, for instance, the poorest of the poor are not the most vulnerable to climate change? How is the balance between vulnerability to climate change and poverty focused? How are they linked?

(*Clare Short*) We are part of the whole international development system so we are trying as a Department to both make our own interventions in countries as effective as they can be in building the country's capacity to grow its economy, reduce poverty, have better public services, improve livelihoods and do it sustainably in countries where we work, but also we are trying to strengthen the international system because we cannot work everywhere but the international system can work everywhere. We are quite big players in the UN system, in the World Bank and in the regional development banks trying to take the best development practice right across the international system and then more and more to get us and others collaborating so that we are not all running separate projects here and there and that we cluster behind countries' own reform agendas and share out the work. Instead of having nice little projects that we can put our flags over and put pictures of in our annual reports and where we put in aid and the experts and when it ends the thing crumbles, we should be building up the capacity of the countries to do it for themselves, and that includes sustainability, awareness of the consequences of climate change, which is the big shift in the mind set on development we are trying to help drive across the international system.

(*Mr Manning*) Perhaps it is just worth adding to that, our first base assessment is precisely the poorest people who are likely to be the most vulnerable to climate change. Obviously you can pick the groups here and there who might be specifically vulnerable and are poor but in general it is people who have very few assets. It will be the people we met in Northern Nigeria, the people living in parts of Bangladesh vulnerable to flooding, it will not be the middle class in Bangladesh who will suffer from climate change, it will be poor people living on these shifting islands. We do not see the climate change agenda as in any way irrelevant to our poverty agenda, the two things over time are very closely linked.

(*Clare Short*) It is the poor old poor who get the brunt all the time, so stick with them and give them a better chance.

Mr Robathan

168. Secretary of State, although we might disagree about nineteenth century politics and struggles, I think that I support largely what you have been saying today about your agenda. I do see the validity of what you have been saying about the northern dominated green agenda. But, to be honest, as Richard Manning has just said, I do not think that good environmental policies and development policies are in any way mutually exclusive.

(*Clare Short*) No.

169. I hope we can move beyond the rather absurd stand of some people on the green side. Particularly what I want to pick up on is sustainable energy. I know I have heard your response to Gareth Thomas on renewable energy in the House a couple of months ago but it seems to me that one of the opportunities—if I can put it that way—at least in terms of renewables, is that developing countries do not need to make the same mistakes as we have made in the developed world. If we were to start with an energy system now, we would not start with the National Grid as we have it now. I think technology has advanced at such a rapid rate that for instance solar energy and similar energies will bring tremendous benefits to developing countries. If I can just give an example. I went to see BMW's hydrogen car today and in five years we will be able to buy a car, internal combustion engine car from BMW which runs on liquid hydrogen. Liquid hydrogen is made with sea water, the developing countries have a lot of solar power that they can crack the hydrogen with. This is an example. Another example is basic stoves; you talk about people's respiratory problems, if you have a basic stove in your hut , you reduce the amount of firewood used by half or a third and reduce respiratory problems. What I would like to ask you is what action is your Department taking, if any, to help develop sustainable and renewable energy infrastructures in developing countries?

(*Clare Short*) Just briefly on your first point, I agree absolutely that there is a completely complementary agenda. The absolutely guaranteed reduction of poverty and the sustainable management of the world have to go together and it is the only safe sustainable future that we have wherever we live in the world. I am quite sharp with the northern green agenda just because, well, I am like that anyway and because I was in Seattle, I have heard it.

Mr Robathan: I agree.

(*Clare Short*) I know there are lots of really well meaning but misled people and I think the challenge needs to be made. As I said at the beginning, the shift is I believe taking place. I think one of the prizes for Johannesburg is to bring this together and to get the predominant mindset of the world to see that it is complementary, and I hope that is what we are going to achieve in Johannesburg. Now, of course, I completely agree that developing countries should take on the technology that might have been developed and not go through all the stages of pollution and so on that we have been through but sometimes again people get romantic and say "Oh, yes, they will not have electricity and substations and generation like us, let us go straight to solar, they have a lot of sun in developing countries" but renewables are more expensive. We have systems in this country to encourage the use of renewables that have to be subsidised because as yet they are still more expensive: wind and solar and so on. What I was saying in answer to the Parliamentary Question was let us not burden developing countries with having to develop the new technology, let us give them support to have the best possible that is available but we can afford to take forward solar. It is not true that every OECD country is not sunny which someone was trying to argue with me the other day. So, of course, renewables are crucial and they are crucial to the future of humanity. It is a sort of romance, they mean completely well, "Oh, let us not have any of that in developing countries, let us go for state of the art renewables" but they are more expensive. The poorest of the world cannot afford to carry the burden of developing those technologies to the point where they become cheaper. I am sure that will happen with solar. It is our duty to humanity to carry forward the research and the development of the technology in our countries so that it can be spread across the world. We should not see the developing countries as a *tabula rasa* where we want to do everything and therefore look for the best possible renewables because they are too dear as yet. We have got a paper about to come out on energy. Six per cent of rural Africans do not have any access to electricity at all. It is starting from where we really are and how you can improve the lives of people by sharing technology. Do you know when that paper is coming out?

(*Mr Manning*) In the next few days.

(*Clare Short*) I think it will be a good piece of work. There is not an ultimate clash in this but there are lots of people who say, "Let's forget all about that and start with solar," but it just so happens that solar is more expensive. And we do stoves!

170. There is only a paper's width between us, perhaps on emphasis. When we were in Vietnam last year we saw micro-hydro plants operating on tiny streams that were not much more than ditches and that brought people who had no access to electricity light at night. I am encouraging you more down that road because I think the difference that can make is enormous for the very poorest.

(*Clare Short*) Thank you but you know what a high quality Department I have with all these fabulous people who have devoted their lives to these matters. All over the world where those technologies are appropriate we are promoting them and helping to develop them, but these people who spend a lifetime trying to help get better energy sources for poor people also say, "Be cautious, do not think there is an easy, simple technological fix her," and we will share the paper with you[5].

Chairman

171. Secretary of State, thank you very much. We are grateful to you and your officials and I think we have learned quite a lot this afternoon. Thank you for that. I think the Environmental Select Committee or someone described you as a "one-woman campaign". I do not think you are a one-woman

---

[5] See *http://enpov.aeat.com/ENPOV/*

[**Chairman** *Cont*]

campaign, in fact, I am sure you are not. Hopefully over the next few months some of us here and elsewhere can start to explain the importance of some of these development issues.

(*Clare Short*) That was Jonathan Porritt. He is a person I have not met but for whom I had some respect. I am deliberately saying sharply to the Environment Committee please, adjust your mind-set, take into account the poor of the world and where they live. There is no sustainable future without them having a better future. That means in Seattle and various other meetings I have been in a clashing position but I think it is a growing position. I know I am not on my own. It is where we have got to get the world to. If the outcome of Johannesburg is that systematic poverty reduction and sustainable development are seen to go together we will have moved the mind-set of everyone.

Chairman: I do not want to re-open discussion but in a sense it is a debate that we have to have here during summer. If it dominates Johannesburg it is going to be very frustrating so it is something that needs to be done beforehand. Thank you very much. We look forward to seeing you next Thursday when there is a debate on the floor of the House on international development.

Supplementary memorandum submitted by the Department for International Development

What practical steps were taken following the publication of the latest IPCC reports and what were DFID's various divisions expected/asked to do with the information?

1. Following the publication of the Third Assessment Report (TAR), DFID invited experts involved in the process to give a presentation of the key points to the Environment Policy Department and Engineering and Environment advisers. This assisted in raising awareness and stimulating discussion on policy responses. Many regional departments reacted to the TAR with discussion amongst senior advisers of what the results may mean for their work. This process is ongoing and momentum is being maintained through ongoing dissemination of new research findings, individual meetings and group presentations. Heads of Department requested hard copies of the IPCC report and also a summary of key aspects for their region/sector and suggestions for identifying ways forward. DFID is working with DEFRA to provide accurate and useful summaries as well as summaries of the International Process.

How is awareness of climate change and climate risk raised with country level programme managers and development practitioners?

2. Senior management Development Committee recently received a DEFRA/DFID joint presentation on the science of climate change, its impacts and its implications for DFID's work. Work on integrating climate change issues into country programmes is primarily through Environment Advisers working with advisers on regional and national programmes. In addition, DFID is producing an internal briefing document on climate change, which it is developing in conjunction with all major sections within DFID, including regional and country desks. The process of producing this document will also help raise awareness and stimulate discussion on how best to respond to some of the issues raised.

3. Looking more widely, DFID has commissioned work to identify how action to reduce poverty and achieve the Millennium Development Goals (MDGs) is likely to be affected by climate change. The study involves representatives from across DFID and DEFRA. The research team will also conduct meetings with development practitioners during the course of the study.

4. DFID is also working with a number of agencies including the World Bank, UNDP and the EC in the preparation of a multi-agency paper entitled: "Poverty and Climate Change—Supporting Poor Countries and Poor People to Cope with Climate Change." The Paper is expected to issue around May 2003.

How does DFID link climate change with climate risk?

5. The TAR outlines the way in which climate change will lead not only to changing frequency and extremes of climatic events such as flooding, hurricanes and drought, but also to more gradual changes in key environmental and resource based processes, such as water availability and vector borne diseases. The climatic risks a country faces may therefore also change as a result of climate change.

6. In order for countries to cope with climate change, adaptation measures require information to be available on the changing variability in climate and then the identification of people and places most at risk. Through its funding of the PRECIS portable regional climate model, DFID is supporting capacity development to improve local level information and better inform policy decisions as well as disaster preparedness. Experience in Bangladesh shows the importance of investment in monitoring systems in reducing the risk of displacement and death as a result of climatic hazards

7. Planning for climate change and changing risks requires interaction and coherence between different policy sections, eg health, agriculture, infrastructure etc. For example, in Ghana, DFID is working with other donors to support the Environment Protection Agency in carrying out a Strategic Environmental Assessment of the Poverty Reduction Strategy (PRS) to look at the links and possible conflicts between proposed actions in health, agriculture etc and the environment.

8. The economic costs of sea level rise, drought etc are likely to become greater as the risk of the climatic hazard occurring increases together with increasing population, urbanisation and wealth. A focus upon poverty reduction creates a framework in which resilience to environmental shocks can be built into growth and help deliver more robust development.

What is DFID's policy on support for disaster mitigation and preparedness work?

9. Disaster preparedness is central to reducing the impact of disaster on poor people's livelihoods. This is recognised by DFID and reflected in our policies which aim to:

- (i) enhance the effectiveness of the international system that carries out work on disaster preparedness (this includes UNDP, the World Bank Prevention Consortium, the International Federation of the Red Cross, and the Pan-American Health Organisation); and
- (ii) ensure that disaster preparedness principles are integrated into country specific policies and plans, including our own country programmes, national policies within developing countries, and co-ordinated efforts such as PRSPs.

How are resources split between funding for relief operations related to climate disaster and funding for DMP activities like early warning systems or drought proofing, for example?

10. The two funding channels are separate. Disaster relief is funded on the basis of response to need, as disasters occur, so this cannot be constrained to an annual budget. During the financial year 2001–02 DFID's Conflict and Humanitarian Affairs Department (CHAD) spent £6 million on disaster preparedness. In some cases country programmes have added to this funding from CHAD.

Has there been a shift away from DMP with the focus more on relief work?

11. No. On the contrary DFID's commitment to disaster preparedness has increased since the 1997 White Paper commitment that "*disaster preparedness and prevention will be an integral part of our development co-operation programme. We shall work with disaster-prone partner countries to develop systems for the better management of man-made hazards and, where feasible, natural hazards, so as to reduce their human impacts.*"

12. A tangible example of this commitment is flooding in Mozambique. Following the devastating effects of the first floods in 2000, early warning systems were implemented. The second floods were not as severe, but the reduced threat to livelihoods was significant.

There is a great deal of discussion about mainstreaming climate change and integrating it fully into policy considerations. Can this really be achieved globally within the current negotiating framework which seems dominated by the concerns of the north and is largely mitigation focussed? Is adaptation going to be adequately considered at a global level and will there be sufficient funding for adaptation activities or will this be limited largely to capacity building activities?

13. DFID believes that the impacts of climate change are fundamental to the development prospects of many poor countries; hence adaptation measures need to be placed firmly in the context of national poverty reduction strategies and other development processes.

14. While the problem of GHG emissions is a global issue requiring collective resolution, the responsibility to implement measures to address its impact (ie, adaptation) most effectively lie with individual sovereign states. The extent to which adaptation measures require a global framework or are indeed influenced by the climate change negotiations—with the exception of developing country requests for financial support—is therefore questionable.

15. Determining the costs of adaptation measures is difficult. It is hard to separate the truly additional costs of responding to climate change from those required to effectively manage "normal" climatic variability. In this respect, many of the measures required to address climate change are the same as those required to reduce the vulnerability of poor countries and poor people to normal climatic variability and other shocks to their livelihoods.

16. Many of the most important adaptation measures are not necessarily capital intensive. Capacity building to understand the impact of climate change and identify the best way of adapting to through appropriate policies and measures may in fact be a highly valuable and the most appropriate use of financial

resources. In Bangladesh the recorded reduction in deaths from successive cyclones may reflect better prediction and response measures rather than investment in improved sea defences and other structures. In other parts of Africa resilience of the agriculture sector could be much improved through better policies that encourage effective investment in land management and drought resistant strains.

What is DFID doing to support the development of NAPAs and does there need to be some framework or guidance for developing countries on what a NAPA should include?

17. The UN Framework Convention on Climate Change (UNFCCC) recognises the specific needs and special situation of least developed country (LDC) parties to the Convention. National Action Plans for Adaptation (NAPA) to, "meet the urgent and immediate adaptation needs of the LDCs" was an early Convention response to this need. Guidelines for the preparation of NAPAs already exist and financial assistance for their preparation is available through the Global Environment Facility.

18. In recognition of the importance of developing country issues, the UNFCCC at its seventh meeting of the Conference of the Parties (COP) agreed to establish a least developed countries expert group. This group comprises 12 experts—including a DFID representative, having recognized competence and appropriate skills. It is mandated to assist in the development of NAPAs through performing the following functions:

(i) to provide technical guidance and advice on the preparation of and the implementation strategy of NAPAs upon request by LDC parties;

(ii) to serve in an advisory capacity to the LDCs for the preparation and strategy for implementation of NAPAs;

(iii) to advise on capacity-building needs for the preparation and implementation of NAPAs and to provide appropriate recommendations, recognising the Capacity Development Initiative of the GEF and other relevant capacity-building initiatives;

(iv) to facilitate the exchange of information and to promote synergies (both regional and between various multilateral environmental conventions) in the preparation and in the implementation strategies for sustainable development; and

(v) to advise on the mainstreaming of NAPAs in development plans and national strategies for sustainable development.

19. The group is also mandated to provide input into the review (and possible revision) of the existing NAPA guidelines at UNFCCC's COP 8 to be held in Delhi in November 2002. In addition to participating in the group DFID is financially supporting its work.

20. DFID's key aim through its participation is to ensure that NAPA's become an effective part of a mainstreamed response to climate change. Experience with other similar (action plans) such as those prepared in respect of biodiversity and desertification is that they have been somewhat abstract assessments of a situation: technically competent but of limited effective use and rarely acknowledged by policy makers. We are conscious of the need to avoid the same happening again.

Much of the detailed planning and policy making on disaster mitigation and preparedness needs to happen at a local or community level but much of the information on climate change impact exists only at a global or national level. How can the gap be bridged? What can be done to ensure that those involved in planning and policy making at local level have access to appropriate, accurate information? In responding to crises, how does DFID ensure that it helps to build local capacity and resilience? What emphasis does DFID place on training local communities in disaster mitigation and preparedness?

21. The IPCC uses global and regional climate models for its predictions. While these provide valuable information in scientific fora, this information needs to be available and accessible in order to inform adaptation policies and plans.

22. DFID, together with the FCO and UNDP, are funding the Hadley Centre, in the UK Met Office to prepare a portable regional climate change (RCM) model. This model runs off a laptop computer and can therefore be transferred between local technical institutes, meteorological centres etc. The model supplies sufficiently high-resolution data for prediction of temperature and rainfall on a national and sub-national scale. This data can then be interpreted to inform adaptation programmes, both in terms of disaster preparedness and longer-term development planning, e.g. analysing how water availability will affect irrigation and agriculture.

23. The RCM is being developed with local implementation capacity as a fundamental principle. Bangladesh has been selected as one of the pilot sites and in autumn 2002 will benefit from local training workshops to enhance capacity to interpret the data available from the RCM. Training will allow government policymakers and local organisations such as Surface Water Modelling Centre, Bangladesh Meteorological Department, the Flood Forecasting and Warning Centre under the Bangladesh Water Development Board,

and the Environmental and GIS Support Project for Water Sector Planning to utilise their own skills for more specific sector level predictions and analysis. In collaboration with the installation of the regional climate change model, DFID is supporting specific research between UK and Bangladesh hydrological institutes to examine the implications of changes in climate and sea level on water resources availability and coastal flooding.

Should there be a climate impact assessment for development projects in the same way that there are environmental impact assessments?

24. DFID is currently reviewing its environmental screening procedures, and within this exercise will consider how climate change impacts should be incorporated into the process.

How can work on sustainable and poverty development planning, which exists at a mainly national level, take account of adaptation processes that exist within communities?

25. DFID is committed to country-owned poverty reduction processes. A healthy example of this process can take into account the national-local balance; firstly by ensuring that the development, implementation and monitoring of the PRS is country driven, with governments in the lead of a genuinely participatory process, and also by promoting partnerships between different sectors of society, including informal networks that often develop in the context of poor people adapting to change. As is the case in any country, local needs can be met if responsibilities are devolved, particularly when implementing policies based on need in a specific geographical area.

How should adaptation and mitigation strategies be linked in developing countries?

26. Mitigation and adaptation are two sides of the climate change coin, but it is not clear that strategies in respect of either can be brought together, or should be seen as needing to be brought together.

27. Mitigation is key to reducing the extent and speed of climate change. If unabated, increasing GHG emissions will result in significant change to global climate with the worst impacts being felt by the poorest in the world's poorest countries. Success with mitigation is therefore a major development policy issue. However, with relatively few exceptions (notably India, China, Brazil and Mexico), few developing countries make any significant contribution to global emissions. Mitigation is consequently unlikely to be an issue for most developing countries but their need to implement effective adaptation measures most definitely is.

28. Where mitigation does concern developing countries—in particular the possibility of extending commitments under any future Kyoto arrangements to include the large developing countries increasingly responsible for global GHG emissions—these measures need not of themselves be associated with any adaptation needs or measures adopted by those countries. It is important however to note that many GHG emissions reducing policies and measures can have positive developmental impacts. For example a shift to cleaner fuels can significantly reduce the prevalence of air pollution a major cause of morbidity and mortality in many developing countries. This has certainly been the case in China.

The use of contraction and convergence as a way forward in climate negotiations

29. Current UK policy on mitigation is focussed on bringing the Kyoto Protocol into force as a starting point for further more significant reductions in emissions. DFID agrees with this objective, but accepts that the target level of emissions reductions in the first commitment period under Kyoto (a 5 per cent reduction of 1990 emissions during the period 2008–12) is probably inadequate. However, it represents a starting point from which to make future progress.

30. For a number of years the Global Commons Institute has advocated the Contraction and Convergence (CC) approach. Within CC "contraction" refers to the need to reduce emissions to a level, which will not impact adversely upon the global climate. This level would represent a global "budget" of GHG emissions and "convergence" represents the process by which shares in that budget would be equitably allocated to all nations on a per capita basis over a period of time. These allocations would be unrelated to current emissions levels.

31. CC advocates propose that in addition to its inherent equity, the approach provides the only way of bringing together developed and developing countries within a single emission reduction framework. They argue that as Kyoto only addresses developed country emissions, it is unattractive to many developed countries that point to the fact that the developing world is an increasingly important source of emissions and will—if current trends remain—be the major source by 2015. Consequently, it is claimed that Kyoto's targets are set at an inadequately low level in order to achieve developed country agreement. Under a CC regime,

the increasing impact of developing country emissions is explicitly recognised. At the same time, they argue, CC would accommodate the developing country perspective that their development should not be held back in order to rectify the damage caused by the existing rich countries to the global climate.

32. The approach has an intuitive logic, but it is based on the simple premise that developed countries will agree to cut their emissions significantly. Regrettably, there is little evidence of their willingness to do so thus far under any form of agreement. Time lines for the completion of convergence have also never been proposed. The concept is therefore interesting but without agreement from the US in particular (along with other Kyoto reluctant parties) to agree to major cuts in GHG emissions under any regime it remains little more than that.

Department for International Development

May 2002

APPENDICES TO THE MINUTES OF EVIDENCE

APPENDIX 1

Memorandum submitted by the British Bangladeshi Professional Association (BBPA)

"Bangladesh, one of the world's poorest nations, is also one of the most vulnerable to sea-level rise caused by climate change. A one metre rise in sea level could permanently flood over 15 per cent of its surface area, displacing between 10-20 million people within what is already one of the world's most densely populated countries"

Adaptation to Climate Change in the Coastal Resources Sector of Bangladesh; Some Issues and Problems (Al-Farouq & Huq 1996) in JB Smith et al Adaptation to Climate Change: An International Perspective

EXECUTIVE SUMMARY

The British Bangladeshi Professional Association (BBPA) welcomes the House of Commons International Development Committee's inquiry into Global Climate Change and Sustainable Development.

As representatives of the largest overseas Bangladeshi community in the developed world, we have a particularly poignant interest in the issue of climate change. This is because whilst the man made factors contributing to global climate change have historically largely come from developed countries, the adverse effects of climate change are predicted to have a disproportionate impact on poor countries such as Bangladesh, that are less well equipped to cope with the consequences.

The BBPA believes that the British-Bangladeshi community can provide a valuable insight into development issues, in particular with respect to policies affecting Bangladesh and its relations with the United Kingdom. We note that communities of minority origin are often inadvertently excluded from policy making debates and believe this is regrettable because it deprives decision makers of the unique perspective that can be provided by such groups. This submission sets out the BBPA's response to the Inquiry. Amongst its main recommendations, the BBPA calls for:

- Equitable share of the global atmosphere in further extension of the Kyoto Protocol when including the developing world (per capita emission rights).
- A new Geneva Convention to cover the increasing numbers of Environmental Refugees.
- Country Strategy Papers for Bangladesh and other developing countries at DFID with significant coastal areas to pay substantially closer attention to the issue of climate change.
- Policy commitments to strengthen the developing world's capacity especially Bangladesh to participate in international negotiations including using nationals and descendants of those countries based in the UK.
- DFID to fund a capacity building aid programme for academic and scientific research in threatened countries like Bangladesh to be procured through their own academic and NGO institutions.
- Transfer of technology in the energy field to the developing world and in particular renewable energy, permitting growth of indigenous energy sector.

If nothing else, many of us in the Bangladeshi community in the UK, would like to continue to be able to visit our relatives in our ancestral home during the rest of our life-time. The BBPA hopes the Inquiry will help to ensure that climate change concerns are not treated as an isolated environmental concern, but are integrated into all aspects of Government policy.

"As the largest overseas Bangladeshi community living in the West, the British Bangladeshi community is in a unique position to contribute to the debate on this key global issue, which has potentially devastating consequences for our ancestral homes" *Hasneen Choudhury, Chairman of BBPA*

1. INTRODUCTION

1.1 The British Bangladeshi Professional Association (BBPA) welcomes the House of Commons, International Development Committee inquiry into Global Climate Change and Sustainable Development. We take an unashamedly pro-Bangladesh stance on many of the issues within the Inquiry making our contribution distinct from others such as the predominantly International Development NGO's and Academic responses. We see this as the best way to assist our ancestral homeland, as an emerging democracy struggling with raising its peoples from absolute and abject poverty and environmental threats posed by climate change. Furthermore we also feel we have particular responsibilities, as representatives of the largest Bangladeshi community outside of Bangladesh, in the developed world.

1.2 To this effect, we have set up an International Development Group to co-ordinate our campaigns and policy work, which to date has included a submission to the DFID White Paper on Eliminating World

Poverty, making globalisation work for the Poor. Here we advocated debt reduction for emerging democracies; honouring our trade commitments along with the rest of the developed world; new UN convention for Environmental Refugees; and last but not least calling for global environmental leadership from the UK government. A copy of the submission can be found in Appendix A. We have also held a one day conference on Climate Change & Bangladesh at the very end of the Marrakech meeting of the Conference of the Parties to the Convention on Global Warming on 10 November, with a special focus on what the Bangladeshi community in the UK can do to safeguard their ancestral home.

1.3 We will also be organising another conference in the late summer of 2002 on Bangladesh and Climate Change, campaigning for the world community to have an obligation to pay serious attention to the views of developing countries critically threatened by climate change and any extension of the Kyoto Protocol to the developing world to be done so on the basis of equitable share of the global atmosphere (per capita share to emissions). It will be undertaken in London in the lead up to the World Summit on Sustainable Development in Johannesburg in September 2002.

1.4 If nothing else, many of us in the Bangladeshi community in the UK, would like to continue to be able to visit our relatives in our ancestral home during the rest of our life-time.

Please find below our responses to all five key areas of the inquiry;

2. POTENTIAL IMPACT OF GLOBAL CLIMATE CHANGE ON DEVELOPING COUNTRIES, ESPECIALLY ON POOR PEOPLE IN THE COUNTRY

2.1 Bangladesh is one of the countries most likely to suffer adverse impacts from anthropogenic climate change. Threats include sea level rise, droughts, floods and cyclones. Approximately a fifth of the country consists of low lying coastal zones within 1 meter of the high water mark and almost 130,000 people were killed in the cyclones of April 1990. With a population of 130 million, most of whom earn less than US $1 a day, it has some of the poorest people in the world. The impacts of climate change will only exacerbate the problems already facing the population.

2.2 Thus when discussing the threat of global warming to Bangladesh, it is worth remembering the following;

(i) Bangladesh is one of the world's most densely populated countries with over 130 million people living in an area roughly the size of England and Wales.

(ii) As a poor country, ($350 per capita GNP) Bangladesh is more vulnerable to the effects of climate change (primarily increased storms and flooding) than most. Over 80 per cent of the country's 130 million people depend on the land for a living.

(iii) Located to the east of India above the Bay of Bengal on the delta where the mighty Brahmaputra and Ganges rivers meet, Bangladesh is traditionally highly fertile thanks to the silt deposits brought about by the regular monsoon flooding of two of Asia's largest rivers.

(iv) However, this fertility which is the reason for the land being so densely populated in the first place, is now threatened by climate change which amongst other things is increasing salinity in the soil as it causes more flooding from the sea, damaging the land as well as destroying homes.

(v) Bangladesh has one of the most densely populated, low-lying, coastal zones in the world, with 20-25 million people living within a 1-metre elevation from the high tide level. The coastline in Bangladesh totals about 735km, of which 125km are covered by the Sunderbans—the world's largest coastal mangrove forest, and home to the endangered Royal Bengal Tiger. Experts fear that sea level rise will permanently harm this unique habitat.

3. BANGLADESH EFFORTS TO MEET MILLENNIUM DEVELOPMENT GOALS

3.1 The country needs to develop a concerted plan of action to face problems of climate change and the development challenges they will present. This will require a well co-ordinated policy for scientific research and development, focusing particularly on building adaptive capacity. In particular, such capacity needs to be developed in the fields of disaster management, agriculture, water resource management, and coastal zone management. For example, Bangladesh and the Netherlands are both low-lying deltaic countries, but the Netherlands has the financial, scientific, and technological capacity to build higher sea walls, whereas Bangladesh does not. The elements of the strategy specific to climate change also needs to be incorporated into national and sectoral planning to ensure that they are compatible with national sustainable development objectives.

3.2 The most important step will be for the government of Bangladesh to appreciate the importance of climate change as a development issue in the short and medium term—not just an environmental issue for the long term—and to develop appropriate scientific and strategic planning initiatives keeping this in view. Some of the problems will also need to be tackled on a regional scale. For example, the watershed problems of the Ganges and Brahmaputra Rivers, which flow through Nepal and India before they reach Bangladesh which will require co-operation across the countries in the region.

3.3 Bangladesh has been able to develop some skills and capabilities in its scientific community to address the problems of assessing vulnerability to climate change and developing appropriate strategic responses. Bangladeshi scientists have played important roles as lead authors of the Intergovernmental Panel on Climate Change. For example, the Bangladesh Centre for Advanced Studies has been a pioneer in preparing assessments of vulnerability to climate change, and the Bangladesh University of Engineering and Technology has been analysing greenhouse gas emissions from different sectors and devising policies and measures to reduce emissions in the future. However, Bangladesh has very few financial resources of its own to support that required scientific research. For example, almost the entire budget for the universities and research institutes is spent on salaries and running costs, leaving little if any research work to be supported by international donors. In this respect, it would be useful for DFID to fund a capacity building aid programme for such academic and scientific research in threatened countries like Bangladesh through their own academic and NGO set ups, so the countries develop appropriate strategic responses. This will obviously aid their ability to participate in international negotiations and it is raised as an issue again below.

4. International Mechanisms for Achieving SD, Mitigating Environmental Degradation and Lower Greenhouse Gas Emissions

4.1 Bangladesh emits less than 0.1 per cent of global greenhouse gas emissions compared to 24 per cent by the United States with less then 3 per cent of the world's population, raising major global equity questions. Future rounds of the Kyoto Protocol extending its coverage to the developing world need to acknowledge this as the US and the rest of the developed world has had the benefit of free riding on the earth's carbon sinks for more than the past century. For such an agreement to be seen as fair by the majority of world's people and thus the agreement to last for a century or more, an equitable share of the global atmosphere is required. As the amount of CO_2 that can be safely emitted is finite, there has to be a long term framework to share out available emissions. The most equitable and logical way to share finite emissions is based on equal per capita emissions rights. We trust in the meantime, the UK government will continue to provide global environmental leadership on these important details and through its special relationship with the US convince it of the importance of it ratifying the Kyoto Protocol.

4.2 Together with other severely threatened nations Bangladesh needs to play a still more important role in international negotiations on climate change. The cause of the problem is being addressed in the international negotiations around the United Nations Framework Convention on Climate Change, but Bangladesh has been able to participate nominally so far. The countries such as Bangladesh, stand to be most adversely affected by the continued emissions of greenhouse gases have an especially powerful interest in global actions to mitigate them. The world community has an obligation to pay serious attention to their views on the establishment of developing country emission targets, which as argued above should be based on equitable share of global atmosphere, for example per capita right to emissions.

4.3 Thus we welcome policy commitments to strengthen the developing world's capacity to participate in international negotiations and hope you would consider extending this to also using nationals and descendants of those countries based in the UK. For example, using British Bangladeshis with relevant background and talents in assisting in better representation of the developing world. This would be a good case of using the human capital available from the wider Bangladeshi diaspora, particularly those in the UK.

4.4 In the UK, we are now about to establish the world's first economy-wide means of reducing greenhouse gases through the introduction of emission trading. It was the UK who gave us this concept, now being embraced in the UK, Europe and elsewhere. The government must seek the active involvement of representatives of the developing world in this new market being created particularly by those representing countries most affected by the consequences of the greenhouse gases, like Bangladesh. Doing so would give more credibility to the extending out of the Kyoto Protocol to cover developing countries greenhouse emissions, as the developing world get actively involved as agents, sellers and buyers of the permits between countries and companies.

4.5 Environmental degradation also leaves the poor more vulnerable to natural disasters. Indeed, moving with your feet has been one of the major responses of human kind to poverty, hunger and environmental disasters. The Red Cross Report of 1998, estimated for the first time that the number of refugees from natural disasters exceeded those displaced as a result of war. Such environmental refugees should be acknowledged and be assisted by a similar 1951 Geneva Convention for political refugees, in their host countries. Such a safety net is the least we in the developed world should offer, as an acknowledgement of our contribution to the global environmental problems and pushing particular models of development.

5. Private Investment that is Environmentally Sustainable and Linked to Wider Aim of Poverty Elimination

5.1 An appropriate area for private investment for poverty elimination and environmental sustainability in Bangladesh is renewable energy and the country's abundant gas fields both on and off shore. The proposed exporting of the gas to nearby markets could well fund the further extension of the electricity to the rural population; reducing fuel wood dependency and giving improvements in people's life, like electric lighting in their homes.

5.2 Bangladesh is also taking steps to reduce its future emissions through the development of renewable energy and the use of relatively clean natural gas. Bangladesh has only been able to supply electricity to less than a quarter of its rural population, this means the country has the opportunity of developing future energy infrastructure with renewable energy including solar photo voltaics as well as wind energy in the coastal areas. Already several groups including Grameen Shakti (a subsidiary of Grameen Bank) is providing photo voltaics and wind energy to rural communities.

5.3 The gas fields are an obvious candidate for foreign direct investment (FDI) in Bangladesh, not withstanding the present discussion in Dhaka about scarcity of gas for future domestic use against receiving receipts now. It has already drawn much interest from foreign companies, and in particular the exporting of the gas to neighbouring India. But the domestic market needs to be developed with a new gas pipe infrastructure particularly for rural households and should be a clear requirement for companies exploiting this natural resource, allowing the transfer of technology to the indigenous energy sector.

5.4 The vast majority of the rural population still rely on biomass energy for their primary energy needs (mainly cooking) which has implications on the rural biomass availability. Indigenous methods of using improved stoves for cooking, bricketing of saw-dust and other biomass and use of peat in the Gopalganj area are worth promoting further to enable the rural poor population to get access to energy in a more efficient and environment-friendly manner.

6. DFID's Policies, Strategies and Programmes on This Front

6.1 Bangladesh is one of DFID's primary aid countries. Over 50 million people, roughly half of its population, officially lives in absolute poverty, mainly in rural areas.

6.2 Ever since the huge international attention focused on the country during its war of independence in 1971, Bangladesh has had a large NGO sector playing a major role in development activities. Bangladeshi NGOs include significant internationally acclaimed success stories such as the Grameen Bank and Gonashastra Kendra (People's Health Centre). During his recent diplomatic trip to South Asia in January 2002, Tony Blair and his wife visited the village of West Kelia, near Savar, the centre of a major development programme run by the country's largest NGO, the Bangladesh Rural Advancement Committee (BRAC).

6.3 DFID's annual aid programme to Bangladesh is about £75 million, making the country the second largest recipient of UK development aid after India. DFID's current Country Strategy Paper for Bangladesh ("CSP") was published in November 1998. It sets six key objectives in line with DFID policy:

(i) Sustainable improvements in livelihoods and basic services for the poor and those vulnerable to poverty.

(ii) Sustainable, broad based and pro poor economic growth.

(iii) Better governance and more effective institutions.

(iv) Improved realisation of human rights.

(v) Improvements to the position on women in society.

(vi) Consistency in UK and Bangladeshi policies in support of the elimination of poverty in Bangladesh.

6.4 The strategy paper envisages an increase in the aid programme to £90 million in 2002–03, with a total of 46 projects with an aggregate value of £263 million, already approved. The next paper is expected to be completed by Autumn 2002.

6.5 The BBPA broadly supports the aims and principles listed by the CSP, but notes with *considerable concern* that little or no attention is paid to the potential drastic consequences of climate change for Bangladesh. As noted elsewhere, the human and political consequences of a large unplanned displacement of people caused by climate change could have grave implications not only for Bangladesh but many other countries. Moreover, it is self evident that a failure to consider climate change concerns could have catastrophic consequences for the attainment of all DFID's other objectives.

6.6 The BBPA believes that the next CSPs for Bangladesh and other developing countries with significant coastal areas should pay substantially closer attention to the issue of climate change.

6.7 The BBPA acknowledges that political instability within Bangladesh and poor governance are widely seen as major obstacles to building on the notable progress made since independence. We note that DFID highlights this factor within its CSP objectives and indicates that "A further increase in programme resources should await movement on reform."

6.8 Whilst acknowledging this principle, the BBPA considers that the special global nature of climate change as an issue, means that a focused increase in resources to address climate change concerns, would not detract from the overall CSP objectives.

7. RECOMMENDATIONS

7.1 In conclusion our main recommendations are:

- Equitable share of the global atmosphere in further extension of the Kyoto Protocol when including the developing world. So as we have equal per capita rights to emissions for all citizens of the world.
- A new Geneva Convention to cover the increasing numbers of Environmental Refugees.
- Policy commitments to strengthen the developing world's capacity, especially Bangladesh, to participate in international negotiations including using nationals and descendants of those countries based in the UK.
- The involvement of Bangladesh in the trading regime being set up in the UK in tradable permits of greenhouse gases.
- DFID to fund a capacity building aid programme for academic and scientific research in threatened countries like Bangladesh to be procured through their own academic and NGO institutions.
- The transfer of technology in the energy field to the developing world and in particular renewable energy, permitting growth of the indigenous energy sector.
- Country Strategy Papers for Bangladesh and other developing countries with significant coastal areas at DFID to pay substantially closer attention to the issue of climate change.

British Bangladeshi Professional Association (BBPA)

January 2002

(Appendix A of this memorandum, letter to the Rt Hon Clare Short MP, and Appendix B, list of BBPA contributors and contact details, have not been printed and have been placed in the Library.)

APPENDIX 2

Memorandum submitted by the British Geological Survey

GEOSCIENCE, GLOBAL CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

Geoscience is a critical factor when considering many of the aspects of sustainable development and global climate change. Geoscience is key to understanding medium to long term climate change patterns and drivers. It also provides the basis for mitigating many adverse impacts.

From an environmental perspective too little emphasis has been made of global climatic change by DFID or agencies supported by them. It is important to recognise that whilst many climate change issues may only influence populations over decades (and thus may presently attract less attention than development issues that function on a seasonal or annual basis), the implications of ignoring them may have severe consequences.

Geoscience must underpin policy development in relation to the human impacts of issues such as:

- Flooding: Vulnerability, and the extent of the impact of past extreme events, past sea-levels.
- Desertification: Pre-historic and historic changes in vegetation and land use.
- Soil Erosion: Susceptibility of soil erosion and breakdown in diversity.
- Groundwater change: Changes in groundwater levels in relation to changes in precipitation or increased irrigation. Changes in chemistry related to sea level change.
- Coastal changes: e.g. erosion, habitats and siltation associated with sea level rise.
- Contaminant remobilisation: in relation to sea level rise or changing river discharge.
- Ground level change or slope stability: caused by changing water tables.

Geoscience records also provide unique evidence of past climate change over time scales from centuries to millennia and so can give a picture about how natural environments have responded to past climatic change in a region. Recent work has shown that many climatic cycles occur over these time scales. It is important to establish patterns of past global change and test climatic models used to predict climatic change before policy changes are made.

In most developing regions, there should be emphasis on assisting developing nations to adapt to change. In particular, the emphasis should be on sustainable development and hazard avoidance, such as:

- Hazard mapping.
- Habitat and vegetation change.
- Coastal vulnerability to extreme and accumulated normal range events.
- Groundwater exploration and protection.
- Soil and agriculture degradation.
- Practices by which man interacts with the landscape and marine environment to enhance the consequences of natural changes.

- Understanding which parts of the world and populations are most vulnerable to expected changes and planning remedial action within a framework of poverty alleviation.

Large scale naturally induced climate changes, with significant impact on human populations, have occurred in the past and will continue into the future. Additionally a pattern of man-made changes is also likely to occur. Man has a short memory and for the last few thousand years has lived in a relatively stable climate. Geoscience indicates that such stability is not normal.

British Geological Survey

January 2002

APPENDIX 3

Further memorandum submitted by the British Geological Survey

Minerals, Sustainable Development and Climate Change:

Is it possible to develop minerals in a sustainable manner?

At first sight it may appear that it is somewhat incongruous to discuss sustainability and finite resources such as minerals in the same sentence. However, crises in the world's natural resources at the present time are much more acute with theoretically "infinite" or "renewable" living resources when compared to mineral resources. For example depletions in North Sea fish stocks and the world's tropical rainforests are much more significant than equivalent depletions of any mineral resource: in fact in the two examples mentioned the situation is almost becoming critical and irreversible reflecting a human inability to manage living resources in a truly sustainable manner.

In contrast there appears, at present, to be few supply-side problems with respect to mineral commodities. Most countries and industries are being reasonably well serviced in terms of being able to obtain the raw materials they require for their industrial needs. It is true that many key strategic raw materials are being produced by a small number of countries (eg South Africa, China, Russia, Chile) and that this increases their theoretical vulnerability especially if political tensions become a major problem, but raw material shortages have not been a major problem in modern historical times.

How can we mine in a sustainable manner? There are a number of key principles which include: involving local stakeholder communities in all aspects of a mining project; maximising natural resources usage; minimising negative environmental impacts; encouraging recycling of waste and secondary materials; strategically planning mineral extraction; remediating old mine sites and maximising the potential of these sites for increasing local social amenities and biodiversity; and attempting to resist the "not in my backyard" syndrome and exporting problems elsewhere. These principles add up to "best international practice" in mineral exploration and mining. These principles are indeed being followed, where possible, by most responsible mining companies in most countries. Most mining companies recognise these principles as "essential business practice" and companies are painfully aware that there are examples (eg Panguna, Bougainville) where mines have closed down as a result of ignoring some key principles. There have been many historical examples and sadly, modern examples exist, of poor mining practices, but it would be fair to say that the majority of the world's mining industry is far more aware of sustainability and corporate citizenship responsibilities than ever before (eg the Global Mining Initiative, www.globalmining.com).

Negative perception and wealth generation

Mining and minerals has had a negative image with a large proportion of the general public for some time. This is partly due to irresponsible and environmentally unfriendly mining practices of the past, but these negative perceptions have also been fostered by "Green" lobby groups and some economic modellers who equate the mining industry with "old fashioned technology—the technology of the 20th, not the 21st century". This changed image contrasts with the image of mining a few decades ago where mining was equated with wealth generation and job creation.

Mining still does generate wealth and create jobs both directly and indirectly. For example, the 45 million/year ball clay extraction industry in the south of England underpins a c.9 billion/year ceramics industry in Europe. Mining can generate very significant wealth for developing countries in the form of hard currency which increases self-reliance and economic independence. Examples of countries who have benefited from mineral related wealth generation include South Africa, Zambia, Chile, China, Indonesia, and Papua New Guinea (not forgetting so-called "mature economies" such as Canada, Australia, the USA and, particularly historically, the UK). Mining can sustain a whole range of commodity processing and manufacturing industry which in turn can stimulate the service and financial sectors. Wealth generated from mining can develop local and national economies and infrastructure: examples where this has not been the case can usually be explained in terms of corruption and low quality governance.

The demand for minerals—remember the real drivers

We often forget that the ultimate driver for mining is the insatiable demand of the consumer. Western lifestyles in particular are mineral-greedy. Many people aspire to owning high quality houses, working in high quality offices, driving cars on fast roads and going on foreign holidays. These aspirations require minerals every step of the way: from the sand, gravel and crushed rock required to build our houses, offices and roads, to the steel and plastic for our cars, to the high value strategic minerals required for aircraft . . . not to mention the energy requirements for all the facilities most "Westerners" use. Every American baby born today will use: a quarter of a million litres of petroleum, 600,000kg of stone and sand and gravel, 400kg of zinc, 20,000kg of steel, and 3,000kg of Aluminium: or a total of 1.6 million kg of minerals, metals and fuels in her/his lifetime (source: Mineral Information Institute, Golden, California).

The mining industry is responding to the demands of consumers and the high quality lifestyle much of the rich world enjoys. If future societies become less "greedy" with respect to minerals and energy usage then there will be less of a requirement for mining. However, until this future material-frugal society is developed there is likely to be an increasing, not a decreasing demand for many raw materials.

Environmental Degradation

There is a legacy of environmental degradation and inefficient energy use by the mining industry (eg Nauru, south Pacific), but there are currently many positive signs which indicate that the mining industry knows it must respond to increasing environmental and climate change awareness of the general public and decision makers.

Mining related environmental degradation includes phenomena such as contaminated land, creation of mineral waste-heaps, contaminated water supplies, atmospheric and soil pollution, land subsidence, etc. There exist at the present time a spectrum of innovative technical solutions to most mining-related environmental problems (eg de-toxifying contaminated land, recycling or landscaping mineral spoil heaps, etc). There is also a highly developed consciousness backed by legislation which act to encourage all mine operators to follow best-practice mining and adopt state of the art environmental monitoring procedures. Further pressure on industry is required to ensure that all mine operators adopt "best international practice" wherever they operate in the world.

Mineral lifecycle modelling: prioritisation of land use

International best practice mining methodologies include mineral lifecycle modelling. This involves a holistic analysis of mineral exploration and practice from grass-roots exploration to mineral extraction to after-mine land care. All mining planning applications must include a detailed analysis of the impact of mining with respect to the land which contains the mineral, the environment, the local communities, transport pressures . . . etc.

Local planning authorities then assess mining applications and attempt to judge the merits of mining activities in comparison to other competing suggestions for land usage (eg agriculture, house building, etc). It should be emphasised that mining is not a permanent utilisation of the land and, providing after-mining land care is undertaken, it should be possible in most cases to use the mine land productively once mining operations have ceased. The British Geological Survey are currently assisting mineral planners by developing holistic mineral information GIS systems which document all relevant data required to make decisions on mining applications. These GIS systems include data on minerals and geology, transport infrastructure, planning constraints, etc and can be intelligently interrogated to provide specific answers to specific questions. These types of modern decision support tools assist planners in prioritising the best land-usage and appropriate land, water and natural resource management of their administrative regions taking a whole range of factors into account.

The importance of minerals to developing economies

Minerals are of vital importance to developing economies. In some cases they may provide a poor country with its only realistic opportunity to generate hard currency-based wealth and increase economic independence. It is also important to note that (1) minerals are not uniformly located throughout the world and can only be developed where they exist; and (2) minerals can only be turned into money when there is a market for them: for example the stone age didn't end because the world ran out of stone, and Saudi Arabia understands that it must realise its enormous oil wealth before the world demand for oil declines significantly. For many developing countries with relatively small economies it is fair to say that minerals can form a large proportion of the country's GNP (eg Papua New Guinea, New Caledonia, Nauru, Chile, etc). Many if not most industrialised economies have used their own mineral wealth as a means of developing their general economy and national infrastructure. For a significant proportion of the developing world, the realisation of potential mineral wealth remains a viable option for economic development.

However, in order to develop mineral resources a country must attract inward investment from mining companies. A country can only do this if: (1) it has a reasonably well developed geological information base (e.g. geological maps and reports—if these are in a modern digital format it is a real bonus); (2) stable government; and (3) a fiscal regime which attracts inward investment.

DFID (or formerly ODA) has historically made an enormous contribution through the BGS to geological knowledge development in many parts of the developing world (Africa, Asia, South America and the Pacific). At the present time however DFID only makes a very modest contribution to geological and minerals-focused institutions in developing countries. This change resulted from policy shifts in the early 1990s partly in response to the negative perceptions of the mining industry as an "environment destroyer". This withdrawal of funding, particularly for residential support and the filling of government line positions within recipient countries, has resulted in a serious weakening of governmental geological survey organisations and related departments and an erosion of their skills, expertise, knowledge, and information base. This very significant deterioration has had a real negative impact on inward investment with respect to mineral exploration and mining. Assistance to the minerals related sector by DFID, particularly the reintroduction of appropriately trained residential teams could quickly and significantly reinvigorate these institutions and introduce modern technology and methodologies. These residential teams would be tasked with governmental policy development, institutional strengthening, skills training, attraction of inward investment, and the encouragement of the adoption of best international practices.

Small Scale Artisanal Mining

It should be noted that mining is not the preserve of large scale multi-national organisations (although this is true for large scale mines which require huge capital investments and take many years to realise profits). Mining of a whole range of commodities from phosphate to sulphur to salt to lime to gold and diamonds is also undertaken by individuals, families and groups on a very basic and simple technological level basis. Large numbers of people in developing countries rely on small scale mining for their livelihood. BGS has traditionally offered a range of support services including geological consultancy and advice on improving mining and environmental practices. These services have been warmly welcomed by the miners and their families and tangible benefits and technology transfer (eg increasing individuals annual salaries) has resulted from the amalgam of BGS project work. In spite of these successes it is becoming increasingly difficult to attract funding from DFID to continue, develop, and make even more relevant these highly socially-focused projects.

Global change and mining

Mining must take its fair share of the blame for generating greenhouse gases. Mining and mineral processing operations, manufacture of products which use mined raw materials, and transport of raw materials all require energy. Aluminium and steel production are highly energy-intensive activities for example. However world market forces encourage the mining industry to concentrate production and transport of large volumes of material at minimum cost: profit margins are small for many mining operators and individual mines. Many bulk minerals attract a low price/unit volume and require to be transported cheaply and efficiently mainly by water (e.g. coal). Technical innovations within the mining industry are tending to lower energy requirements.

One specific case is worthy of mention in this connection. Mining in fragile ecosystems such as low lying ocean islands is something which should be undertaken with the greatest of care. Mining in these environments can lower the land surface of an already low-lying island, and inappropriate offshore mining may upset the local recharge of sediment to beaches and offshore sediment accummulation zones, and increase water turbidity and fine-sediment concentrations which can have a negative impact on the local ecosystem. However low lying islands still require minerals to sustain and develop their industry and infrastructure and environmentally sensitive solutions must be sought for their specific needs.

Conclusions

It is time that the negative perception of mining as "an environmental destroyer" is revisited. Mining can be undertaken using sustainable principles. The modern mining industry is aware of its environmental and social obligations and will provide an increasingly environmentally-friendly and energy-efficient service, especially if pressures for the adoption of international best practices are maintained at a high level. Mining and mineral exploration can generate significant revenues for many developing world countries, and this wealth can be used to develop national economies, infrastructure, social welfare systems, and further industrial development. Traditionally DFID has been a generous sponsor of minerals-oriented projects in developing countries but has largely ceased funding this type of work. A revival in particularly residentially-focused minerals projects would be a cost-effective way of providing lasting economic support to many developing countries and attracting inward private company investment. Mining has a climate cost as with all primary and manufacturing industry, but this is not, on the whole, a disproportionate energy burden relative to other industries.

British Geological Survey

January 2002

APPENDIX 4

Memorandum submitted by The Corner House

SUMMARY AND RECOMMENDATIONS

1. To support sustainable development, environmental regeneration and poverty elimination in developing countries, particularly to the benefit of the poorest people within those countries, the Department for International Development (DFID), and the multilateral agencies and non-governmental agencies to which DFID contributes, should first and foremost act to curb emissions of greenhouse gases in developed countries.

2. Current "mitigation" schemes, such as emissions trading, the Clean Development Mechanism (CDM) and Joint Implementation are likely to make sustainable development harder to achieve in developing countries; to increase the negative impacts in these countries of climate change; and to increase numerous disparities between developed and developing countries. In particular, carbon "offset" plantations are likely to increase forest loss and forest degradation; to increase climate unfriendly practices; to increase rural to urban migration; and to increase conflicts.

3. The very idea of carbon accounting involving the biosphere is impossible and thus trading in carbon involving the biosphere is inherently fraudulent.

4. Ultimately, to support sustainable development, environmental regeneration and poverty elimination in developing countries, particularly to the benefit of the poorest people within those countries, the Department for International Development (DFID), and the multilateral agencies and non-governmental agencies to which DFID contributes, should support initiatives to keep fossil fuels in the ground; to support alternative sources of energy; and to support (or at least not thwart) movements working towards these ends.

1. *To support sustainable development, environmental regeneration and poverty elimination in developing countries, particularly to the benefit of the poorest people within those countries, the Department for International Development (DFID), and the multilateral agencies and non-governmental agencies to which DFID contributes, should first and foremost act to curb emissions of greenhouse gases in developed countries*

For a century and a half, industrial societies have been moving carbon into the air from underground reserves of coal and oil. The most important greenhouse gas is carbon dioxide, which is responsible for perhaps three-quarters of global warming. (Others include methane, nitrous oxide, CFCs and HCFCs.)

North America, Europe, Japan, Australia and other industrialised regions already use far more than their fair share of the atmosphere as a greenhouse gas dump: developed countries are responsible for 75 per cent of current annual greenhouse gas emissions. The United States produces roughly one-quarter of the greenhouse gases which are released yearly in the world, and one-third of its carbon dioxide, even though it has only 4 per cent of the world's population. Just over 120 corporations account for 80 per cent of all carbon dioxide emissions.

To stabilise levels of greenhouse gases at a level twice those at the time of the industrial revolution, global emissions would have to be reduced from the current one tonne of carbon per person per year to an average of 0.4 tonnes. The US emits 13 times this amount per head (5.2 tonnes) and Japan and Western European nations 5-12 times this amount (2-5 tonnes). More than 50 Southern countries, including India, emit less than half the maximum level (0.2 tonnes per person).

In addition to current disparities in greenhouse gas emissions, there is also an accumulated "carbon debt" which the developed countries owe to developing ones because of their disproportionate emissions over the past century and a half. The Brazilian government has argued that the North is responsible for 80 per cent of total accumulated emissions, and 88 per cent of global temperature increase.

Yet the Kyoto Protocol allows developed countries in various ways to continue emitting high levels of greenhouse gases. It rewards historically high emitters and penalises low emitters, such as many developing countries, and thus gives developed countries unsustainable and unfair atmospheric dumping rights.

Many industrialised countries have abandoned the goal of meeting their Kyoto Protocol targets by reducing emissions, while most climate negotiators no longer discuss how to make deep cuts in fossil fuel emissions.

Instead of lowering its greenhouse gas emissions by 7 per cent by the year 2012, as specified in the Protocol, the United States is likely to increase them by 25-30 per cent. Indeed, nearly half of the total growth in global carbon dioxide emissions since 1990 has come from the US, more than the combined increase of China, India, Africa and Latin America. Instead of cutting its emissions by 6 per cent, Canada will probably increase them by 44 per cent. Since 1990, Australia's carbon dioxide emissions have risen by 17 per cent and Japan's by over 14 per cent.

Some Southern delegates to the international climate negotiations have insisted strongly that the industrialised countries—those historically responsible for the problem of global warming—must take action first to reduce their emissions dramatically. There is no long-term technical solution to global warming short of leaving the bulk of the remaining minable fossil fuels in the ground.

Trading carbon sequestered in tree plantations for carbon resulting from the burning of fossil fuels (see points 2 and 3 below) cannot justify postponing deep reductions in carbon dioxide emissions in industrialised countries.

2. *Current "mitigation" schemes, such as emissions trading, the Clean Development Mechanism (CDM) and Joint Implementation, aimed at helping industrialised countries meet their commitments to reduce greenhouse gas emissions, are likely:*

- *to make sustainable development harder to achieve in developing countries;*
- *to increase the negative impacts in these countries of climate change; and*
- *to increase numerous disparities between developed and developing countries.*

In particular, carbon "offset" plantations are likely to increase forest loss and forest degradation; to increase climate-unfriendly practices; to increase rural to urban migration; and to increase conflicts.

According to the July 2001 Bonn agreement of the Kyoto Protocol, developed countries can use set up tree plantations in developing countries to "compensate" for up to 1 per cent of their emissions above their 1990 ceiling—a total of 145 million tonnes of carbon dioxide a year. Depending on the carbon calculations (see note 3 below), this allows developed countries access to a parcel of land roughly the size of one small Southern nation every year for use as a carbon dumping ground. If plantation lands are assumed, generously, to sequester five tonnes of carbon per hectare per year during the short life span of plantations, the Bonn agreement sanctions the use of 10 million hectares of Southern land annually as a carbon disposal zone.

Tree plantations aimed at "compensating" for industrial carbon-dioxide emissions are now being established in many parts of the world. The push for them puts particular pressure on local land and water rights in developing countries and could well become a source of rural strife.

It should be noted that forests and tree plantations are completely different entities. It is critical that a distinction is made between them in climate change discussions. Large-scale tree plantations that would be established as carbon sinks are likely to feature densely packed monocultures of fast-growing species such as eucalyptus or pine, which are of little or no value to forest biodiversity. Consisting of thousands or even millions of trees of the same species, bred for rapid growth, uniformity and high yield of raw material, such plantations require intensive preparation of the soil, fertilisation, planting with regular spacing, mechanical or chemical weeding, use of pesticides. A trade in carbon would increase the area of industrial pulpwood, oil palm, rubber and other tree plantations which already pose severe social and ecological problems worldwide. The most frequently cited environmental impacts are:

- reduced soil fertility;
- increased erosion and compaction of the soil;
- loss of natural biodiversity;
- reduced groundwater reserves and stream flow;
- increased fires and fire risks.

Industrial tree plantations have in many cases been preceded by the burning or clearcutting of native forests, or they have taken over productive cropland and pastures. In many cases, they have resulted in forced displacement or resettlement of local people. In Chile and Indonesia, tree plantations have destroyed natural forests. In South Africa, Argentina and Uruguay, they have replaced valuable ecosystems such as grasslands. In Brazil, Thailand and Chile, tree plantations are at the root of serious land conflicts among local communities, landowners, corporations and the state. Nearly everywhere they have been established, industrial tree plantations have destroyed people's livelihoods in agriculture, fisheries, animal husbandry and gathering, and have led to a loss of water resources and biodiversity. The few jobs they create cannot compensate for these losses, especially when such jobs are insecure, seasonal, badly paid and frequently dangerous.

To attempt to counteract just a small fraction of industrial emissions of carbon dioxide, millions of hectares of new plantation land would have to be taken over. Experience with existing large-scale tree plantations suggests that such "offset" projects would take away needed agricultural lands, replace valuable native ecosystems, worsen inequity in land ownership, increase poverty, lead to evictions of local peoples, and undermine local stewardship practices needed for forest conservation. Those evicted from land wanted for plantations could well clear forests elsewhere to make up for lost food and other crops.

The Norwegian firms Tree Farms and Norwegian Afforestation Group, for instance, have leased land from Uganda at cheap prices to soak up Norwegian carbon dioxide. This take-over threatens the livelihoods of 8,000 people, mainly farmers and fisherfolk, many of whom consider themselves the owners of the land in question. Carbon revenues to the companies will far exceed the rent paid to the Uganda government.

In neighbouring Tanzania, Tree Farms anticipates selling carbon credits from pine and eucalyptus plantations worth US$27 million to Industrikraft Midt-Norge on a land rent payment to the Tanzanian government of $565,000. Local people were hired as casual plantation workers at a rate less than the government's minimum wage (US$1.05). The agreement requires Tanzania not only to give up rights to use the land but also to use the land in its own carbon dioxide budgets in the future.

Even if millions of hectares of land was taken over, the new plantations would in practice do little to mitigate climate change. The ostensible point of carbon "offset" forestry is to take some of the carbon out of the atmosphere and keep it on or near the earth's surface. It would need to do this for 100-150 years or more to have full effect. Unlike subterranean oil or coal, however, carbon stored in live or dead trees is "fragile": it can quickly re-enter the atmosphere at any time. Fires, for instance, are unavoidable features of forests and plantations. Plantations, meanwhile, typically reduce the capacity of soils to store carbon both inside and outside project areas. Thus vulnerable, dynamic and unpredictable plantations are insecure storage places for carbon. Keeping the carbon from re-entering the atmosphere for a century or more would require forms of biological, political and economic policing unknown in human history. At present, only 12 per cent of the carbon warehoused in commercial tree plantations has a life expectancy of more than five years. Some of the time periods of carbon "offset" projects are substantially less than one hundred years. The specified time period of one eucalyptus plantation in New South Wales, supposedly offsetting the power needs of 3,750 suburban homes, was 10 years, making the project in fact virtually irrelevant to global warming.

Even so, licensing the burning of fossil fuels in developed countries by financing tree plantations supposedly to "absorb" carbon dioxide in developing ones would expand the ecological and social footprint of the developed countries, making existing inequalities between and within countries worse. Citizens of a developed country which uses (say) 20 times more per capita of the atmosphere for carbon dioxide-dumping than citizens of a developing country would be entitled, under the rationale of carbon trading, to use 20 times more tree plantation land in order to compensate for their emissions. This land would in practice be taken disproportionately from poorer people in developing countries.

Thus the push for carbon "offset" plantations extends and normalises inequality. Trading emissions for tree carbon would intensify the regressive redistribution of world resources. "Carbon trading" between developed and developing countries suggests that it is legitimate for richer countries and companies—which already use more than their share of the world's carbon sinks and stocks—to buy still more of them using cash which has itself been accumulated partly through a history of overexploiting those sinks and stocks.

Moreover, when developing countries begin to have to make cuts in their emissions, they would be at a disadvantage because their cuts would in effect have already been purchased and credited to the developed world. In addition, rural dwellers may well have been carrying out carbon storing or sequestering projects for generations, yet gain no credit for doing so.

3. *The very idea of carbon accounting involving the biosphere is impossible and thus trading in carbon involving the biosphere is inherently fraudulent*

A market in "carbon offsets" presupposes a notion of "climate neutrality" or "climate equivalence", on the assumption that a carbon atom in a tree is the same as a carbon atom in a greenhouse gas emission. Yet the claim of quantifiable "climate neutrality" upon which the trade in carbon emissions rests has no sound scientific basis. Nonetheless, it still sanctions external political interference in the policymaking of many developing countries.

In order for a plantation "offset" project to be tradable for a given amount of industrial emissions, a single determinate number would need to be calculated to represent the amount of carbon sequestered or stored as a result of the project over and above what would have been sequestered or stored in its absence. This cannot be done because none of four conditions are met:

(i) The current state of biophysical knowledge regarding the sources of carbon and the sinks which absorb carbon in the world is not remotely sufficient to determine the quantitative levels and flows of carbon between the atmosphere and biosphere with sufficient accuracy.

(ii) There is unlikely to be consensus on who or what—country, corporation, group or individual—is entitled to which carbon credits. Accounting presupposes accountability. Who is to be credited and debited?

(iii) As well as biophysical knowledge, sociological knowledge is also needed. Planting trees, for instance, is likely to have social effects, such as outrage from local farmers, diminished interest in renewable energy and a loss of local knowledge (see point 2 above). These social effects may have further physical effects, such as migration to the cities and increased use of fossil fuels. But the social effects of plantations, which affect the amount of carbon stored, are impossible to quantify, to predict, to monitor or to control.

(iv) The question of what would have happened without a plantation can never have a singular answer: several alternative emissions scenarios are possible. It is impossible to compare quantitatively the atmospheric effects of a plantation with "what would have happened without it" because the second scenario depends on so many variables which cannot be prejudged.

The market for carbon "offset" plantations presupposes an accounting system capable of commensurating and calculating over decades the global interactions of intercoupled ecological, social, geological, political, hydrological, bureaucratic, biochemical, economic and atmospheric systems. Such an accounting scheme is quadruply impossible. No equivalence between industrial emissions and trees can be established of the type that would be necessary to establish a "carbon offset" plantation market.

This market's impossibility has not stopped efforts to construct it. But the construction can never be completed. Bad or unverifiable carbon credits are likely to jam any carbon trading system involving the biosphere. Cheating will be encouraged and uncontrollable. Ultimately, the market is unlikely to survive. Far from being checked, climate change will be subsidised and exacerbated—to the detriment of the poorest.

Meanwhile, the lives and livelihoods of many people in the South will have been adversely affected by offset plantations.

Even the carbon trading enthusiast Michael Grubb concludes that the Clean Development Mechanism has the potential to become:

> "not just a source of spurious emission credits, but a sink for the intellectual as well as some of the physical resources of the developing world, and a distraction from the fundamental goals of sustainable development". (Grubb, M, *The Kyoto Protocol: A Guide and Assessment,* Royal Institute for International Affairs, London, 1999.)

4. *Ultimately, to support sustainable development, environmental regeneration and poverty elimination in developing countries, particularly to the benefit of the poorest people within those countries, the Department for International Development (DFID), and the multilateral agencies and non-governmental agencies to which DfiD contributes, should support initiatives to keep fossil fuels in the ground; to support alternative sources of energy; and to support (or at least not thwart) movements working towards these ends*

Some 4,000 billion tonnes of carbon fossil fuels are still under the earth's surface—more than ten times the amount of carbon stored in forests. According to current scientific consensus, adding as little as a few hundred billion tons of this to the air could result in a climate disaster even beyond the extreme storms, droughts and floods, disruptions of agriculture, increased pest infestations, drowning islands and coastlines and huge movements of "climate refugees" to which the world is already committed.

DFID should support national and international efforts to address climate change through energy conservation, particularly in developed countries; consumption reduction, again in developed countries; more equitable resource use; and equitable development and sharing of renewable sources of energy.

It should strengthen or guarantee forest peoples' and local communities' rights to land and natural resources. It should support local people's rights and struggles against the invasion of their lands by industrial tree plantations and encourage awareness of the negative social and environmental impacts of large-scale industrial monocrop tree plantations. It should support existing positive practices and initiatives which go straight to the political and social root causes of global warming, including:

- the protests of communities against oil drilling and burning in their territories;
- research into energy efficiency and renewable energy programmes;
- movements protecting community forests and low-input swidden agricultural systems, who thereby prevent climatically-destabilising land clearance, commercial logging and high-input intensive agriculture;
- initiatives which emphasise the importance of an equitable property rights regime as a prerequisite for a "contraction and convergence" agenda for action on climate change.

Most important of all, it should work to end state subsidies, including export credits, for oil, gas and coal extraction, fossil-fuel generation projects, and the transport of internationally-traded goods.

The Corner House

January 2002

APPENDIX 5

Memorandum submitted by The Green Globe Task Force

It is already well established that climate change will impact disproportionately on the world's poor:

- Many live in environmentally marginal areas (low-lying estuarine or coastal zones, arid or semi-arid areas) where they are already highly vulnerable to climate extremes, and these are expected to worsen with climate change.
- They have less resources with which to adapt to climate change.

The predominant policy focus to date by the UK and multilateral institutions has justifiably been on climate modelling and mitigation of GHG emissions in developed countries through development of the Kyoto Protocol. Yet the least-developed countries that are the focus of DFID's poverty-eradication policies have per capita emissions that are tiny compared to the global average, and their immediate climate-related priority must therefore be adaptation, both to current climate variability and to projected climate change.

KEY FOCII FOR THE UK'S INTERNATIONAL DEVELOPMENT EFFORT:

Climate change does not feature prominently within the environmental or economic policy agenda of developing countries. The UK could play an important role in supporting a programme of policy analysis which would address the issues outlined below, and build capacity in developing country institutions.

(i) *Ensuring that climate change-oriented programmes deliver as many ancillary sustainable development benefits as possible*

Energy is a vital component of all development, yet two billion people currently have no access to basic energy services such as a connection to mains electricity. As a result they have to rely on locally available fuels such as wood, animal dung and crop residues, the use of which have negative health and environmental impacts. Access to alternative energy sources can give enormous health benefits via reduced indoor and outdoor air pollution. The Kyoto Protocol's Clean Development Mechanism (CDM) allows developing countries to either initiate mitigation projects on their own, or to develop such projects jointly with industrialised (Annex 1) countries. CDM could provide a valuable source of additional finance for energy sector projects such as renewable or low-carbon power sources, as well as providing a mechanism for technology transfer. It is essential that the UK and Europe's climate policies are designed and implemented in a way that enables successful implementation of the CDM.

Forestry-sector mitigation projects. Forest sinks have an important role in GHG mitigation strategies. If properly designed, these have the potential to deliver important development benefits such as watershed protection, access to forest products, biofuels and others. However, they also have the potential to harm both development and environmental goals by displacing indigenous peoples, threatening existing agriculture and reducing biodiversity.

(ii) *Ensuring that climate policies do not, and are nor perceived to be obstructing economic development*

In many developing country situations fossil fuels (coal, oil, gas, kerosene) are likely to remain the cheapest, most readily available sources of energy for many decades. In the transport sector particularly, there are as yet few viable alternatives. Any GHG-reduction polices in developing countries must not result in inequitable restrictions on access to such sources of energy.

(iii) *Ensuring that, where possible, development initiatives support climate change objectives*

Sustainable agriculture. Biomass energy, small-scale hydropower and low-input organic farming all have the potential to deliver climate-related benefits. In addition, policies designed to reduce vulnerability to current climate variability such as improving the drought resistance of crops or irrigation will also provide adaptation benefits.

Development priorities such as *energy, water supply and waste water treatment services* have the potential to increase GHG emissions, but could be delivered using renewable, local resources that provide both environmental and social benefits. Energy efficiency policies have clear development benefits as well as reducing GHG emissions.

(iv) *The impact of globalisation*

It is useful to consider climate change together with globalisation. Both these processes are acknowledged to generate both winners and losers. A key focus for DFID should be to identify the communities that are "double losers". One example is Sub-Saharan Africa which has seen a reduction in GDP over recent decades as well as having many areas characterised as arid or semi-arid and therefore most vulnerable to changes in rainfall intensity or temporal distribution.

(v) *Harnessing private investment*

Private investment has rightly been identified as a key component in the effort to deliver development objectives. However, there are distributional features that mean that this is unlikely to work in the case of the poorest developing country populations. The majority of current investment in developing countries is focused on a small number of countries, and even within these countries there are huge inequalities. A key function for government/multilateral institution funding is to target the areas overlooked by private capital, either directly, or in a way that leverages capital into projects that would otherwise be unattractive to private investors.

For further information and a list of members see http://www.green-alliance.org.uk/GreenGlobeTaskForce.htm

The Green Globe Task Force

January 2002

APPENDIX 6

Memorandum submitted by Greenpeace UK

1. The International Development Select Committee inquiry covers a broad spectrum as detailed in the guidance notes. This breadth of area demonstrates the complex interconnections of the impacts of climate change, sustainable development, and poverty reduction.

2. Global climate change is the single most pressing issue facing the world today, and can only be tackled by phasing out our use of, and dependence upon, fossil fuel sources of energy, and switching instead to renewable energy sources. The developing world has an opportunity to avoid repeating the mistakes made in following fossil fuel energy pathways by the North, and instead, providing energy to meet people's needs in a clean and sustainable way.

3. Greenpeace International and The Body Shop International have launched a campaign to bring renewable energy to the world's poorest two billion people who currently have no access to electricity services. The campaign hopes to secure a ministerial declaration at the forthcoming World Summit on Sustainable Development in Johannesburg, to deliver renewable energy to these two billion using bilateral and multilateral financial assistance. Greenpeace UK would welcome the IDC inquiry's view on this demand.

4. To provide such services will mean a tenfold increase in the number of renewable systems available, and supplying the infrastructural capacity to meet it. It is estimated that the total investment required will be between $200-250 billion—equivalent to the annual global subsidies that are given to the fossil fuel and nuclear industries. It will be necessary to use public money to kick-start the programme to deliver renewables to the two billion. It is estimated that $10-30 billion of Official Development Assistance (ODA) money will be required over the next 10 years, to lever sufficient investment from companies and individuals to meet this target. This ODA will be needed for credit to families and seed capital for Small and Medium Size Enterprises. We hope that the UK Government will adopt and champion this approach at the WSSD following the leadership role that it played in the setting up of the G8 Renewable Energy Task Force.

5. To avoid the potential impacts of climate change caused by fossil fuel use from devastating the social and economic development of the South, large-scale renewable capacity will need to be developed in both the North and the South.

6. For this to happen in the South, the methodologies used for assessing macro-project financing by northern countries must be changed, as they are currently skewed towards the peculiarities of fossil fuel power plants and are inappropriate for large renewables projects that entail higher up-front costs. The institutions that facilitate North—South energy investment need to adjust policies appropriately to meet the challenge of creating clean, sustainable energy pathways in the South.

7. The UK Government is a signatory to the Kyoto Protocol and the initiator of the G8 RETF report. However, this commitment to tackle greenhouse gas emissions and climate change is not reflected in its foreign direct assistance. The UK Export Credit Guarantee Department (ECGD) provided support for 140 fossil fuel and nuclear power generation projects, and fossil extraction projects, in 38 countries between April 1992 and April 2001. The total contract value was £15.85 billion. This means that the UK Government has supported an average of nearly £1.76 billion worth of fossil and nuclear power generation projects in every year since the United Nations Framework Convention on Climate Change was signed.

8. By a conservative estimate, these projects will emit at least 14 million tonnes of carbon per year for as long as they are in operation.[1] This is more than a third of the emissions from the UK's own power generation sector (41.917 mtC in 2002)[2] and represents around 300 million tonnes over 20 years of plant operation.

9. In recent years the UK ECGD has done £3.5–£4 billion a year in business. This is around twice the size of Britain's international development budget. In 1999–2000 civil business was 55 per cent of the total. Power generation and transmission were 39 per cent of total civil business (or around 21.5 per cent of total business)—and energy investment another 10 per cent (5.5 per cent of total)[3]. Expenditure on power generation has averaged around 20 per cent of all ECGD lending since 1992.

10. In contrast to this, to date, the ECGD has not invested in any renewable projects, other than in large and medium sized hydro-dams.

11. Through the ECGD the UK Government is effectively exporting global warming and encouraging developing countries to follow an energy pathway that will have serious climactic repercussions that will impact hardest on those countries themselves. This is even more scandalous when we consider that of $119.75 million (£82.6 million) that the UK gave in bilateral ODA commitments to energy in 1999, only $0.09 million went to renewable energy. This means only 0.07 per cent of total UK ODA money for energy development went to supporting renewables.

12. The UK Government has taken a lead in tackling climate change but through the ECGD it continues to support patterns of development that are incompatible with sustainable development, poverty alleviation and climate stabilisation. The G8 Renewable Energy Task Force report indicates that renewables can meet the energy needs of developing countries, but UK assistance for clean energy development continues to decline.

RECOMMENDATIONS:

1. The developing world stands at an energy crossroads and it is critical that the pathway of clean, sustainable energy prevails, to avoid locking the South into a damaging and unsustainable, long-term, energy trajectory. If development in the South is achieved in the same way as that in the North, the global consequences will be catastrophic. The resulting climate impacts will condemn millions of the world's poorest people to increased drought, floods, disease and extreme weather events. The infrastructures and economies of the world's poorest countries will be severely and negatively impacted, putting a block on future development.

2. This is an issue that needs to be addressed with the utmost urgency, and the UK Government should make use of the forthcoming World Summit on Sustainable Development to address the issues raised by the IDC—poverty, climate change, sustainable development and energy.

3. Greenpeace recommends that the UK Government:

— (a) Take a lead at the WSSD to secure,

  — a heads of government commitment to facilitate the delivery of renewable energy to the two billion.

  — international ODA and public funds to kick-start the necessary investment.

  — a timeline for delivery.

— (b) Increases its ODA commitments accordingly.

— (c) Puts an end to the funding of fossil fuel and nuclear powered energy projects in the South and instead directs investment to renewables, changing the ECGD accordingly.

— (d) Stimulates the UK domestic renewables market and ends subsidies to fossil fuel and nuclear power generation and extraction/processing.

Greenpeace UK

January 2002

---

[1] Based on an estimate of 10,588MW of coal-fired generation, 1,508MW of gas-fired generation and 600MW of oil-fired generation. These estimates are derived from data in ECGD annual reports from 1993–94 to 1999–2000 and because data in the ECGD reports is not complete, the estimate is likely to fall short of the total amount of power generation supported by some distance. Nor does it include any power generation projects financed in 2000–01 as data on this year has not been made available. In addition, the conversion factors used to calculate CO_2 emissions are for new plant installed in 1998 in Annex One countries, whereas plant installed with support of the ECGD will in some cases be of earlier design and therefore may be of lower efficiency. The conversion factors are taken from tables supplied by *The Greenhouse Gas Protocol—a corporate accounting and reporting standard,* World Business Council on Sustainable Development and World Resources Institute, 2001. See www.ghgprotocol.org. Conversion factors for Annex 1 countries in 1998: 0.857 tonnes $C0_2$/MWh for coal; 0.367 for gas; and 0.568 for oil. It is assumed that plants are in operation 60 per cent of the time—ie 5,242 hours per year. [10,588 x 5,242 x 0.857 = 47,565,467 tonnes CO_2 per year from coal. 1,508 x 5242 x 0.367 = 2,901,111 tonnes CO_2 per year from gas. 600 x 5242 x 0.568 = 1,786,474 tonnes CO_2 per year from oil. 47,565,467 + 2,901,111 + 1,786,474 = 52,253,051 tonnes CO_2 per year from coal, gas and oil. Using conversion factor of 3.666, this yields 14,250,832 tonnes per year of carbon.

[2] DTI Energy Statistics Digest 2001.

[3] From ECGD *Annual Report and Resource Accounts, 1999–2000.*

APPENDIX 7

Memorandum submitted by the Joint Nature Conservation Committee

1. INTRODUCTION

1.1 The Joint Nature Conservation Committee (JNCC) was established by the Environmental Protection Act 1990 as a committee of the then newly-created country nature conservation agencies and others. The Countryside Council for Wales, English Nature and Scottish Natural Heritage are the Government agencies responsible for safeguarding and promoting wildlife and natural features in Britain. CCW and SNH have additional duties to conserve landscapes, and to encourage and sustain opportunities for public enjoyment of the countryside.

1.2 The JNCC is the forum through which the three country agencies act jointly to deliver their special statutory responsibilities for nature conservation in Great Britain and internationally. Since devolution, these special responsibilities have also related to the Scottish Executive and the National Assembly for Wales, as well as the UK government. The involvement of the Environment and Heritage Service, an agency of the Department of the Environment (Northern Ireland), allows us to adopt a consistent approach across the United Kingdom, wherever this is appropriate.

1.3 The JNCC's special responsibilities contribute to maintaining and enriching biological diversity, enhancing geological features, and sustaining natural systems. They are principally to:

- advise Ministers on the development and implementation of policies for, or affecting, nature conservation in Great Britain or internationally;
- provide advice and disseminate knowledge to anyone about nature conservation affecting Great Britain and internationally;
- establish common standards throughout Great Britain for the monitoring of nature conservation, and for research into nature conservation and the analysis of the results;
- commission or support research which the Committee considers relevant to the special functions.

1.4 Staff from the three country agencies work on behalf of the Committee, either through assignment to a central Support Unit, through inter-agency groups, or by acting as a lead agency on particular topics.

2. CONTEXT

2.1 Most of JNCC's work on climate change is discharged by the Inter-Agency Climate Change Group which is chaired by English Nature. The group's activities include a programme of scientific research into the impacts of climate change on biodiversity, the outputs of which are directed towards informing the development of policies and practical solutions for nature conservation.

2.2 Currently, JNCC's main concern in relation to global climate change concerns the UK Overseas Territories. In particular, JNCC is undertaking a collaborative project with the Tyndall Centre for Climate Change Research (University of East Anglia) into the implication of climate change for the biodiversity of the Overseas Territories. The study will commence shortly and will be carried out by a research student over a three-year period.

2.3 It is anticipated that this project will make a significant contribution towards the effective implementation of environmentally sustainable development in the Overseas Territories. The findings are also likely to be relevant to certain other countries.

3. "IMPLICATION OF CLIMATE CHANGE FOR BIODIVERSITY IN THE UK OVERSEAS TERRITORIES": PROJECT OUTLINE

3.1 The UK Overseas Territories largely comprise small island ocean states, which together make a significant contribution to global biodiversity. They also contain ecosystems that are likely to be highly vulnerable to climate change, as a consequence of the flooding of coastal habitats due to sea level rise, coral bleaching due to increased sea surface temperatures, storms causing widespread destruction, and changes to land-based systems caused by changes in temperature or rainfall.

3.2 A report co-authored by members of the Tyndall Centre (*The Impacts of Global Climate Change on the Overseas Territories;* report to DFID OUT 2001) examined the likely impacts of climate change on Anguilla, Montserrat, the Pitcairn Islands, St Helena, Turks and Caicos, and Tristan da Cunha. The conclusions were that global climate change could have severe consequences for human livelihoods, especially through impacts on coastal systems. However, the consequences for endangered species and communities were not considered in any detail. Environmental protection is a critical component of sustainable development, and the identification of problems and the initiation of appropriate adaptation measures in relation to biodiversity conservation are, therefore, of high priority. Moreover, it is envisaged that the JNCC will need to contribute significantly to this process through dialogue with the UK Foreign and Commonwealth Office and the UK Overseas Territories Conservation Forum. The aim of this project is to inform that dialogue and assist the JNCC in executing its special functions.

3.3 The most important species and communities for each of the island Overseas Territories will be reviewed along with their likely sensitivities to climate change. The species will include not only those that are likely to be specifically threatened on each island, but also those that belong to internationally important assemblages and those that are economically important and fall under Convention on International Trade in Endangered Species (CITES) regulation. In each country and for each habitat, ecological importance, socio-economic importance, threats from climate change and other threats will be tabulated. This review will then be used to identify the habitats and areas at greatest risk from climate change, and consequently the habitats requiring more detailed research. Where appropriate, as in the case of seabird colonies, consideration will also be given to global change impacts on the wider marine environment.

3.4 The next stage will be an intensive study of a number of key habitats (such as mangroves, coral reefs and forests) in which the factors affecting the distribution, quality and species composition of the habitat will be assessed. This will involve a detailed comparative study across habitats, where necessary extending to similar countries outside the Overseas Territories. The objective will be to produce a model predicting habitat distribution in relation to a range of factors, including climate.

3.5 The importance for biodiversity of these habitats will be evaluated along with the wider economic importance of the biodiversity (e.g. for mangroves: tourism, nursery areas for fish, water purification, coastal defence; for coral reefs: fishing, diving tourism, coastal protection; for forests: watershed protection, forest products, carbon storage). Consideration of economic factors will enhance the value of the project for sustainable development.

3.6 The climate change models will then be combined with the habitat distribution models to predict likely changes in the distribution and quality of habitats within the territories, and the potential consequences for biodiversity and the local economies. This analysis will then be used to suggest mitigation measures.

Joint Nature Conservation Committee (JNCC)

January 2002

APPENDIX 8

Memorandum submitted by the Intermediate Technology Development Group (ITDG)

GLOBAL CLIMATE CHANGE AND SUSTAINABLE DEVELOPMENT

1. The inquiry of the International Development Committee into Global Climate Change and Sustainable Development, as set out in the detailed guidance notes, is to be comprehensive and far reaching in its scope. This reflects the complexity and multi-faceted nature of the impacts of climate change, and the interdependence of the many factors affecting sustainable development and poverty reduction. ITDG is in agreement with the IDC on the importance to global sustainable development of climate change caused by the actions of humanity. In contributing to the deliberations of the Committee we would like to focus on the central issues and comment from the perspective of our own experience.

2. The burning of fossil fuels for industrial, commercial and domestic energy use, as well as transportation, is the primary human source of 75 per cent of all green house gas (GHG) emissions. Energy consumption has consequently become a key focus of attention in debates about climate change. ITDG, an international NGO, has been working on practical and policy aspects of appropriate energy technologies for over 20 years, and for these reasons we shall focus our comments on questions concerning energy consumption and generation.

3. Climate change is primarily a consequence of the activities of industrialised countries. Though more than three quarters of the world's population are poor, they have contributed less than one third of human carbon dioxide and methane gas emissions and less than 20 per cent of industrial emissions. A significant reduction globally in GHG emissions will therefore require changes in energy consumption patterns in industrialised countries.

4. Despite being a minor contributor to GHG emissions, the poor in developing countries are the most vulnerable to climate change through less stable climate, greater incidence of natural disasters, desertification, and risks to food supplies. Sustainable development in the South requires concerted action by the governments of industrialised countries to reduce the GHG emissions that cause climate change, and it would be erroneous to place the burden of fossil fuel reduction on developing countries.

5. Developing countries need adequate energy provision to meet basic human needs, as well as for economic and social development. Currently an estimated 1.5 to 2 billion people globally lack adequate energy supplies. Though energy consumption in the South needs to increase in order to reduce poverty, current relatively low levels of energy consumption provide an opportunity for a cleaner energy technology path to be adopted.

6. The general world-wide trend is towards clean energy technologies. It has been estimated that the markets for clean energy technologies (CET) will grow from less than US$7 billion today to US $82 billion by 2010 (www.cleanedge.com). Some clean technologies, such as wind power, photo-voltaics, and fuel cells, will continue to experience double-digit annual growth. However, the growth of clean technologies will be uneven, with some experiencing faster commercialisation than others.

7. With respect to renewable energy, it is likely that the main increase will come from large-scale hydro plants. It is predicted that the world will be using 50 per cent more hydro power by 2020. Other renewables, despite a significant growth rate, will account for only 3 per cent by 2020, up from the current 2 per cent (*World Energy Outlook, 2000, OECD*).

8. The trend towards clean energy technologies (CETs) will have a positive impact on reducing the emissions of greenhouse gases (GHG) and ultimately on the environment. However, it is not obvious that the benefits will be equally shared and that poor people will be among the beneficiaries. This is in part because a wide range of technologies can be considered as CETs, and scale and complexity can vary greatly within the same type of technology. Wind energy, for example, could be harnessed by deploying large grid connected wind farms, with imported equipment in the case of developing countries, or through small decentralised wind systems based on local technical and manufacturing resources.

9. Generally, the consumption of fossil fuels in developing countries needs to increase if the international development targets are to be achieved. Given their low levels of energy use at present, their contribution to GHG emissions will therefore marginally increase. This increase can be limited by using cleaner fuels, greater energy efficiency, greater use of renewable energy sources, and fuel substitution in urban areas. In some cases, for example China and India, there is a need to cut fossil fuel consumption in countries through substitution and energy efficiency.

10. Lessons from the North could help countries in the South to design energy strategies which take into consideration the environment, without compromising the poverty reduction goal. This implies a development model inclusive of energy choices based on a pattern of energy consumption that will optimise the use of small-scale decentralised energy. For instance, high energy efficiency lamps could be, in the long term, the best domestic application for renewable energy despite their relative high initial cost.

11. The sustainable supply of improved and affordable energy services for meeting household energy needs is the first priority of poor people. It is also of vital importance in the reduction of poverty. The International Energy Agency has estimated that more than two billion people in the developing world use biomass for cooking. The total requirement of biomass for cooking in developing countries is around 350 million tonnes of oil equivalent (*World Energy Outlook, 2000, OECD*). About half the world relies on biomass fuels for domestic energy, with consequent excessive levels of indoor air pollution to which women and children are exposed.

12. Indoor air pollution is one of the leading causes of infant and child mortality in developing countries. In Asia, such exposure accounts for between half and one million excess deaths every year. In sub-Saharan Africa the estimate is 300,000 to 500,000 excess deaths (*WHO Air Pollution guidelines: Fact Sheet No. 187, revised September 2000*). Indoor air pollution is also a major contributory factor in chronic obstructive lung disease in women who cook using biomass, and is also implicated in active TB and blindness. Although the problem of indoor air pollution is now recognised, there has been very little done in working with communities to identify appropriate and affordable interventions to remove smoke.

13. The International Energy Agency has estimated at 60 per cent the potential population who may switch to more sustainable use of biomass. The financial costs to provide this portion of the population with more efficient cooking stoves are estimated to be around US $12 billion. Estimates indicate that, outside China, fewer than 100 million people get their meals cooked on improved stoves. Providing energy-efficient cooking stoves to an additional 200 million people would amount to a total cost of US $2 billion.

14. The impact of small-scale energy technologies and particularly renewable energy may have a significant impact on the livelihoods of poor women and men because a limited amount of power allocated to basic domestic and productive end uses is sufficient to improve dramatically the social and economic conditions of poor communities.

15. ITDG's work over the last two decades on improved stoves and micro hydro had positive impact on the environment compared with other available credible options. The stove programme in Kenya, for instance, was successful for a number of reasons: the central production of key components; the use of small enterprises to produce and market affordable stoves in areas where users could afford to pay; the use of women's groups for stove dissemination in rural areas; and the tailoring of designs to meet local conditions.

16. Successful demonstrations of the best technical, social and economic practices in the field of small-scale energy projects should be replicated on a large scale to make a significant impact on poor people. A recent study by ITDG evaluated small scale energy projects (improved cookstoves, biogas digesters, solar home

systems and micro hydro power) in terms of both their emission reductions and the development benefits they provided. This analysis has been used to provide guidance to policy makers for the implementation of the Clean Development Mechanism (CDM) under the Kyoto Protocol.

17. The experience of ITDG, and others, in addressing the energy needs of poor communities and small-scale producers, particularly of women, has identified a number of areas where further action is required. To achieve cleaner energy technology paths in developing countries, and contribute to poverty reduction, it will be important:

- To explore alternative, cleaner energy options for lighting and cooking such as biogas wind, and solar, to widen the range of affordable and appropriate energy options for poor people;
- To develop the capability to design, implement and operate small-scale renewable energy projects, where they can be proven to be more accessible, more cost-effective, and more sustainable than fossil fuel based options;
- To emphasise the use of energy for productive purposes, low cost technology for energy conversion and use, and the preference for local equipment and raw materials; and
- To research and develop a comprehensive policy framework to make fuel-switching a viable option for the urban poor.

18. Sustainable development and mitigation of the impact of climate change require the development and diffusion of appropriate technology and the strengthening local capabilities to provide alternative energy options. There is currently no development co-operation mechanism which would favour small-scale projects implemented by local players such as small entrepreneurs, rural communities. Reliance on market mechanisms, which tend to be geared towards Northern consumers, is unlikely to develop and deliver the technologies required to enable the poor to adopt a cleaner energy path. Yet there is a vast potential for local, small-scale projects which, if replicated on a large scale, could have a significant impact on climate change and sustainable development. Support for the development and diffusion of energy technologies appropriate to the needs of the poor should therefore be an integral element to international development co-operation strategy.

Intermediate Technology Development Group (ITDG)

January 2002

APPENDIX 9

Memorandum submitted by the Royal Dutch/Shell Group of Companies

1. INTRODUCTION/SUMMARY

1.1 Royal Dutch/Shell Group, operating in 135 countries, has adopted "contributing to sustainable development" as one of its core business principles. This means that we will not only produce efficient and affordable supplies of energy for heating, light and mobility, and provide the petrochemicals products and solutions that consumers choose, but we will assess the economic, environmental and social impact of these activities. By integrating sustainable development considerations into our key business processes and maintaining a dialogue with key stakeholders, we seek to create business value through responsible business conduct.

1.2 Key considerations are:

- Shell views the way in which we manage our business and work with stakeholders as key to achieving success, while providing a return to shareholders who have invested in the company.
- The provision of energy is a major demand of people in developing countries to provide the basics of life and to enable development. To provide these products and services sustainably is a challenge both for developing countries themselves and the companies that operate within them. Frequently the demand for affordable energy in the short term can be seen as a higher national priority than wider environmental or social concerns.
- We are committed to reducing our own greenhouse gas emissions and to supporting our customers, partners and suppliers to reduce theirs by offering fuel alternatives and by developing new technologies. We also wish to progress projects under the Kyoto Protocol's Clean Development Mechanism, which provides credits for those involved in carbon-saving projects in the developing world.
- Substituting gas for coal and other high carbon sources, which would otherwise continue to play a major part in energy provision in developing countries, can significantly reduce greenhouse gas emissions while meeting the demands for affordable energy. For example, the Shell-led Malampaya gas to power project inaugurated in October 2001, will produce 25 per cent of the Phillippines' power, reducing CO_2 emissions, generating substantial revenue for the Philippines and reducing the country's dependence on imported energy supplies, thereby saving precious foreign currency

previously spent on energy imports. In the future the Clean Development Mechanism could assist in pushing these technologies in developing countries.

- As the demand for lower-carbon energy sources and cleaner products grows, we aim to combine our technical and commercial experience with innovative technologies to aid the transition from petroleum-based fuels to a portfolio of other energy sources.

2. COMMENTARY

2.1 Business can play a vital role in building a better future for more of the world's growing populations. The Shell Group continues to make a substantial contribution to local economic prosperity through operations in over 135 countries, employing 90,000 people, the majority of whom are local people, and through the use of local contractors and suppliers.

2.2 Our operations include investing in more sustainable technologies that can contribute to sustainable development and lowering greenhouse gas emissions. Examples include: Shell Renewables bringing renewable power to remote or non-grid supplied communities in a sustainable way, at a price our customers can afford (we currently have schemes in Indonesia, Bolivia, South Africa and Sri Lanka and are reviewing other business opportunities); investigating opportunities for geothermal power in El Salvador and coal gasification in China (a technology which will provide clean and cost effective feedstock for a chemical plant and could also be applied to the energy and chemicals fields).

2.3 The heart of our contribution to sustainable development is the way in which we manage our business based on our core values of honesty, integrity and respect for people everywhere. These are embodied in the Shell General Business Principles, which govern all our business affairs and describe the behaviour expected of every employee in every Shell company in the conduct of its business.

2.4 An important part of building confidence with stakeholders in our values and performance, through openness and transparency, is the publication of reliable information, in our annual Shell Report[1]. These same values led to the establishment of the Shell Foundation in June 2000, a registered charity, which contributes funds and expertise to projects that particularly tackle social and environmental challenges related to energy access and use (page 22 of the Shell Report). Its work complements the local social investments of Shell companies around the world and is a further step in Shell's work to integrate the principles of sustainable development in all its activities.

2.5 Our actions to reduce our own greenhouse gas emissions (with a target of reducing 2002 co_2 emissions by 10 per cent of 1990 levels) include:

- Introduction of a strategy to ensure that our future investments will be robust in a world which will increasingly reduce carbon use, by considering the effect of a possible carbon cost in our investment decisions for new projects that could produce emissions over 100,000 tonnes a year of CO_2.
- Development of the use of market mechanisms. In 2000 we introduced a pilot internal emissions trading system (STEPS—Shell Tradable Emission Permits Scheme), covering some two-thirds of Group Annex 1 Country emissions. The pilot has raised the profile and added to the understanding of emissions trading within the Group and has given Shell the opportunity of contributing its experience to the various schemes under development, including the UK Emissions Trading Scheme (UKETS). STEPS has been established in tandem with our 2002 greenhouse gas target. More recently, we have started the process of externalising the use of market mechanisms, through the creation of a specialist Environmental Products Trading Team within Shell Trading. This team has global responsibility for the use of these new mechanisms in order to maximise our capability in this emerging field.

2.6 Governments can support action on climate change in a number of ways, namely:

- Work with the grain of energy markets and facilitate the longer term transition of energy markets.
- Rely wherever possible on international market mechanisms like emissions trading, minimizing administrative burdens and transaction costs and protect companies that take early actions.
- Take a consistent international approach to addressing this global issue, including making a start at engaging developing countries. This is critical to avoiding competitive distortions, containing costs and addressing the needs for growing energy use in developing countries.
- Encourage the development and introduction of new energy technologies.
- Establish a clear and stable policy regime to allow decisions on long term investments.

2.7 Looking to the future, while longer-term renewables may offer an emissions-free alternative to fossil fuels we do not believe it will be possible, or desirable from an overall sustainable development viewpoint (balancing economic growth, social development and environmental objectives), to phase out fossil fuels completely for many decades. Nonetheless technological advances will continue to make fossil fuels cleaner while alternatives are developed. Eventually concerns over resource scarcity together with social and personal priorities, will also drive the mix of fossil and other fuels over such a period.

---

[1] Available at http://www.shell.com/shellreport

2.8 In terms of power generation and heat, gas is particularly important in offering an environmentally and economically attractive bridge towards a future where renewable sources of energy can begin to play a major role in energy supply. Governments should ensure the benefits of gas are properly recognized in evolving international policies.

2.9 Oil will remain crucial for transportation needs in particular, until reliable, convenient and cost competitive alternatives are developed, for example hydrogen. Through Shell Hydrogen we are already investing in technological routes to this goal of a low carbon economy with the economic and environmental benefits this could bring the developing world.

2.10 Mobility, already poor for most developing world urban dwellers is declining. Pollution, much of it transport-related, is in some areas at extremely high levels and is growing worse in the developing world. Through the World Business Council for Sustainable Development, Shell is one of a number of companies to sponsor their Sustainable Mobility Project, which aims to develop a global vision of sustainable mobility and to suggest possible pathways towards that goal, and we hope ultimately firm actions.

3. Conclusion

3.1 We believe therefore that as a business, Shell can and is making an important global contribution to sustainable development. However, there is a range of external barriers to successful private sector involvement in developing economies. In particular, these barriers are associated with poverty: weak governance, inappropriate legal and policy frameworks to encourage private sector investment, and limited developmental capacity. Governments, donors and civil society, have historically tackled these challenges but because these issues affect us as a business, we have also sought to tackle them in a variety of ways. For example we have advocated change, operating in accordance with our Business Principles, by working with communities to design and implement social development programmes, and through the efforts of the Shell Foundation to increasing access by the poor to energy services.

3.2 Partnership is crucial to tackling these challenges to sustainable development. While we have already established partnerships with a range of stakeholders in different countries, we believe that stronger, wider and mutually benefiical partnerships between business, governments, inter-governmental agencies, civil society and donors will need to be established if we are all to succeed in our efforts to promote sustainable development. A key challenge for us all is to explore, develop and succeed in creating such new partnerships.

Royal Dutch/Shell Group of Companies

January 2002

APPENDIX 10

Memorandum submitted by the RSPB

1. Introduction

1.1 The RSPB is Europe's largest wildlife charity with over one million members. We are the UK partner of BirdLife International, a worldwide partnership of environment organisations, which has more than 2.5 million members in 103 countries and owns conservation estates in excess of a million hectares (there are BirdLife Partners in Ghana, Nigeria and Sierra Leone).

1.2 Site-based conservation, in which land is set aside on which to conserve wildlife and its habitats, form the backbone of much of the work of the RSPB and BirdLife. In addition to protecting wildlife, such protected areas yield multiple socio-economic benefits. For example, they provide local employment and amenity value for both local and foreign visitors. Indeed, wildlife and eco-tourism resulting from the presence of parks and reserves is a significant source of foreign income for many developing countries, especially in Africa.

1.3 Climate change poses fundamental problems for nature conservation worldwide, threatening both the environment and the people who depend upon natural resources. This memorandum outlines this threat and identifies mechanisms both for minimising environmental degradation and lowering greenhouse gas emissions in developing countries.

2. The Threat of Climate Change to Wildlife Parks and Reserves

2.1 As the world's climate changes, zones of similar climate will move to varying extents. For example, in the UK, they will tend to move northwestwards and upwards in elevation. In West Africa, drier, desert conditions will tend to move southwards. In Brazil, drier conditions are likely to move southwestwards, from the Northeast, into Amazonia.

2.2 Plants and animals will tend to move with the moving climatic zones. This clearly poses problems for a global system of nature conservation based primarily upon protected areas of land that will not move. Moreover, not all species will move at the same rate. Those in the middle of their ranges may not move at all, whereas those at the extremes of their ranges will, or risk extinction. New ecosytems are thus likely to emerge, and some existing ones will be lost. The unique Great Karoo ecosystem in South Africa may, for example, disappear.

2.3 Species movements are likely to be complicated and often aggravated by an increase in extreme weather events (such as storminess), sea level rise in coastal areas, and a host of development pressures exacerbated by climate change. (Increasing desertification in much of Africa will, for example, lead to increased foraging for firewood in protected areas.)

2.4 The wildlife parks and reserves that are the principal source of income in some of the poorest developing countries, and a significant source in many more, are thus likely to change substantially as a result of climate change and, in many cases, for the worse.

3. Support for Parks and Reserves

3.1 In the short term, there is an urgent need for more research into the extent of regional and local climate change and its impacts. Whilst there is increasing levels of work on these topics in developed countries, there is comparatively little covering developing countries.

3.2 Climate change modelling work, which is very expensive, is likely to continue to be performed in developed countries in the near future. On the other hand, research into impacts and the development of adaptation strategies, where local knowledge is essential, is best done primarily at a local level.

3.3 It is particularly important that adaptation of nature conservation strategies is performed at the local level, because it is essential that it not only takes into account the local environment but is also integrated into local sustainable development plans. Whilst it will be necessary to broadly develop and coordinate adaptation strategies at the international level, their practical delivery must be local.

3.4 A number of international and regional agreements provide for the establishment and maintenance of wildlife parks and reserves. The Convention on Biological Diversity (CBD), for example provides for the establishment of protected areas, worldwide, as does the World Heritage Convention and the Ramsar Convention. The "continental" conventions such as the African and Americas wildlife treaties, and other regional agreements such as some of the UNEP Regional Seas agreements, have similar provisions.

3.5 Many of these treaties also contain provisions for financial support from developed to developing countries. The CBD, for example, provides for support both bilaterally and via the Global Environment Facility (GEF, which also serves the Climate Change Convention and the Convention on Desertification). The UK should offer increased support for adaptation of nature conservation policy via both. It should also offer support for integrating such adaptation policies into broader sustainable development plans.

4. Support for Emission Reductions

4.1 The Kyoto Protocol (together with the more detailed agreements reached in Bonn and Marrakesh in 2001) provides an excellent basis for achieving low emission development in developing countries. It specifically provides for fast-tracking of smaller-scale renewable energy projects in developing countries, especially least developed ones, via the Clean Development Mechanism. This is intended primarily as a business investment tool, rather than a government aid provision. DFID should therefore promote and facilitate UK business use of the Mechanism for smaller renewables projects in least developed countries.

4.2 The Government should not promote carbon sequestration projects via the Clean Development Mechanism, certainly until the detailed biodiversity safeguards for such projects are resolved by the UN Framework Convention on Climate Change.

RSPB (Royal Society for the Protection of Birds)

January 2002

APPENDIX 11

Memorandum submitted by Peter Yeo

SUBMISSION RELATED TO "POLICIES PURSUED BY DONORS IN RELATION TO ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT"

Three ways in which aid personnel can combat climate change:—

1. *Avoid negative demonstration effect*

The activities of expatriate aid personnel too often encourage practices which have a negative effect on climate change.

Examples:

- A Project concerned with village-level education attempted to give equal attention to all parts of Nigeria, which meant spending about 30 per cent of their time travelling by road. It would have been more useful, and less damaging, to work in depth in a single state, and later to spread knowledge based on this local experience.
- The same Project used a Land Rover when more fuel-efficient vehicles could have been used.
- A Project in Tanzania, also concerned with village-level education, created the implication that mobile teams with Land Rovers and generators were necessary to do the job. Unintentionally, they devalued the work which officers based at District Headquarters could have done in the villages they could reach by public transport, without carrying generators.

2. *Communicate local best practice*

In most countries, some local people have already developed sustainable farming practices. Aid personnel can help to spread such good practice by applying communication expertise and by lending their aura as "experts" to peasants who would not otherwise be seen as worth copying.

Examples:

- Along the Southern edge of the Sahel, ordinary farmers sometimes manage to push back the encroaching desert (*New Scientist,* 27 October 2001, p 44). Aid personnel could help to spread these local good practices to farmers who are less successful.
- Aid personnel in Nigeria, whose expertise was not primarily in agriculture, were persuaded to make some five minute "filler" items for radio on such topics as composting. The senior official in the federal agricultural ministry who commissioned the work was asked why he didn't ask his own colleagues to do this work. He said, "none of our agriculture specialists could say anything in five minutes". He needed environmentally conscious communicators more than he needed expatriate agriculturalists.

3. *Changing local bad practice*

It is usually easy to identify practices which damage the environment. Stopping them is the difficult part. Attempting to change public opinion is often more fruitful than punishing offenders.

Example:

- A woman in Vietnam who admitted that she had misused her loan from a micro-credit scheme to buy equipment for electric fishing. Regulations to ban this type of fishing and the giving of loans for this purpose were already in place. However, coming down heavily on all those who had broken the law in this case would only have ensured that future crimes would be better concealed. The long term solution lay rather in attempting to persuade her fellow members (whose approval was needed for all loans) that destroying fish stocks would be bad for all their futures. The people running the micro-credit scheme recognised that they needed advice on adult education much more than on fishing or law enforcement.

Peter Yeo
(Mr Yeo was employed by the Co-operative College UK for 30 years)

January 2002

APPENDIX 12

Memorandum submitted by Professor David Crichton

1. GENERAL POINTS ABOUT INSURANCE

- Insurance could help to protect investment in infrastructure and so encourage donor countries to contribute to development.
- The insurance industry has considerable expertise in risk management. This could reduce vulnerability and exposure to risk.
- Insurers have access to global reserves of capital through reinsurance so that the costs of a disaster in one country can efficiently be spread throughout the global economy.
- The prompt payment of claims could speed up socio economic recovery, and promote resilient reinstatement to reduce future vulnerability.
- Insurers are interested in the potential market from developing countries, but this is considered high risk in countries that do not have political stability. There are also issues of whether the people in those countries would be prepared to spend money on such an intangible service. Insurance could only work in partnership with the donor country, the relevant governments, and the relief agencies.
- Globally, the insurance industry is three times bigger than the fossil fuel industry and its investment managers control 30 per cent of the world's stocks and shares. In the UK, the Association of British Insurers (ABI) published guidelines in October 2001 for socially responsible investment to apply to all companies in which UK insurers may wish to invest. Such considerations can, and do influence the actions of multinational companies.
- The United Nations International Strategy for Disaster Reduction (UN-ISDR) initiative and the UNEP Financial Services Initiative (UNEP-FI) could be the catalysts for setting up insurance and financial partnerships in developing countries. UK insurers are active in the UK Advisory Committee for Natural Disaster Reduction (the focal point for communication with UN-ISDR) and in UNEP-FI (Crichton, 2001a). It would be perhaps beneficial if DFID were to consider a closer dialogue with these bodies (the author would be happy to facilitate this).

2. SUSTAINABLE DEVELOPMENT

This concept seems to mean different things to different people when it comes down to practical issues. In particular the question of resilient construction is often ignored. Climate change will bring many threats to structures and buildings (Garvin *et al,* 1998). "Building Green" is a non-structural solution to the problems of climate change and four ways to build green are outlined below:

- Reduce greenhouse gas emissions.
- Sequester carbon dioxide.
- Reduce vulnerability to storm, flood and other damage.
- Reduce exposure by building in safer areas.

The insurance industry can assist with data and premium incentives.

3. BRIEFING NOTE TOPICS:

3.1 *"The potential impact of global climate change on development and developing countries and especially on poor people in those countries"*

Increased risk from an increase in extreme weather events, combined with sea level rise and gradual changes in precipitation and temperature levels, could jeopardise a country's ability to borrow money for development purposes. However it is not just the increasing hazard that must be taken into account. Exposure and vulnerability are increasing too.

The growth in losses, both insurance and economic, needs firm action (Munich Re 2000, and figure 1 in appendix). If this growth continues at this rate it has been estimated that by 2065, losses from natural catastrophes will exceed the total GNPs of every country in the world, even before taking into account the implications of climate change (Retallack, 2001). Around the world, buildings are more vulnerable and more exposed than ever before, as people use lighter building materials and more are forced to live in hazardous areas such as near the coast or on floodplains. Climate change is bringing record weather conditions around the world (Crichton, 2001a) and the projections indicate that hazards will be increasing dramatically in the future.

The Risk Triangle (Crichton 1999, and figure 2 in the appendix) can be used as a framework to help address the three components of risk: hazard, vulnerability and exposure.

3.2 *". . .the effect that these countries' policies for Sustainable Development will have on the environment and global climate change"*

The European Commission and 36 other countries signed the Aarhus Convention in June 1998. It establishes the right of all citizens to live in a healthy environment, and is the first ever convention to safeguard citizens' access to information and public participation and access to justice in environmental matters. Insurers need access to such information too, and conformity with the Aarhus Convention, or its equivalent, is a pre requisite for insurance cover.

3.3 *"The potential offered by donor programmes . . ."*

No comments.

3.4 *". . .the need for private investment that is both environmentally sustainable and links with the wider aim of poverty elimination"*

Private investment, for example in infrastructure, would be more likely if adequate insurance cover is available. It is ironic that the World Bank will make sure that a construction company will have insurance during construction, but when the bridge, or road is finished and handed over, there is often no continuing insurance.

Of course in some areas, insurance is not currently feasible, for example Goma, hit by the recent Nyiragongo volcanic eruption. Would it be wise for an insurer to offer cover for a city which has an economy founded on aid, smuggling, and arms dealing, with no warning or evacuation system in place? Such a city is unlikely to make an attractive market for the insurance industry. Economic and political stability, plus compliance with the Harare Declaration are crucial.

Given a stable political situation, and a co-operative government, insurers could offer premium incentives for risk reduction measures, they could reinstate damaged buildings in a more resilient way, and they could give risk management advice. They can spread the risk beyond the national economy to the global economy, and assist recovery with not only money, but also expertise.

In the Caribbean, a UK insurer (Royal & Sun Alliance) set up a programme with the Red Cross to provide disaster preparedness training to staff in hotels they insured. If the hotel participated, they received a premium discount. Another insurer in the Caribbean offered discounts to policyholders with hurricane resistant homes, and financed handbooks on the subject for builders (Davis, 2002).

There are interesting examples from developed countries too. In New South Wales in Australia, the banks specify the building standards needed to enable someone to obtain a mortgage. In Florida, insurers have assisted with the enforcement of building codes and the training of inspectors (Crichton, 2001a). In Scotland, insurers specify what levels of flood hazard are acceptable to insurers, and local planners now ensure that they do not allow new homes in areas where the hazard is higher than the "insurance template" unless effective flood control measures are introduced (Crichton, 1999b).

Such moves are possible because of a partnership between insurers and government (or local government). For example, the insurance template, which operates so successfully in Scotland, does not apply in England, where the partnership is less strong, and houses are increasingly being built in flood hazard areas, against the advice of the Environment Agency[1].

Therefore the first stage of working with the insurance industry is to build up a dialogue and trust between donors, receiving governments, the relief agencies on the one hand and insurers and reinsurers on the other hand. This can hopefully lead to partnership solutions, and the Commonwealth Disaster Management Agency is a good start.

3.5 *"DFID's policies, strategies and programmes on environmental sustainability and especially global climate change"*

DFID should adopt the principle of "Contraction and Convergence" as set out by the Global Commons Institute. This seems to be the "only game in town" at the moment to which all countries are likely to be able to agree. It is a UK initiative which has been welcomed by developing nations around the world, as well as by the EC and Rt Hon. Michael Meacher MP.

---

[1] This is important, because in 2001, the insurance industry announced that in Britain it might no longer be able to guarantee to continue to provide cheap flood insurance for houses in flood hazard areas after 2002. Insurers had provided such a guarantee since 1961, and in some ways are to blame for the amount of housing which has been built in floodplains since then, because the presence of insurance has enabled people to get mortgages (Crichton, 2001b).

4. DFID PUBLICATION: "ACHIEVING SUSTAINABILITY, POVERTY ELIMINATION AND THE ENVIRONMENT." (DFID, LONDON, OCTOBER 2000)

It is disappointing that the potential importance of the role of insurance is given no prominence in this document. There is no mention of the UNEP Finance Initiative, which was well under way by 2000.

Annex 2 contains details of a number of international environmental agreements, but the Harare Declaration and Aarhus Convention are conspicuously absent. It seems to the writer that without these or their equivalents, all the other agreements are just pieces of paper.

If the publication is revised, it should include sections on:

- Contraction and Convergence,
- the UN International Strategic Disaster Reduction Initiative,
- the UK's Advisory Committee on Natural Disaster Reduction[2],
- the DFID supported "Livelihoods Initiative"
- the work being carried out at The International Institute for Applied Systems Analysis (IIASA), funded by the DTI and the UK insurance industry, to investigate ways to provide cover to developing countries (in press).

It would have been good to see a section on the increasingly important role of Earth Observation (EO) in helping to protect the environment and in disaster reduction and relief. If an updated version of the publication is produced, one would hope to see mention of important earth observation initiatives such as the EU's "Global Monitoring For Environment And Security" (GMES) programme, "GIFTSS", "NEDIES", the UN "Earthwatch" programme, or the work of the CEOS, especially the "IGOS" initiative. These initiatives are all co-funded by UK Government, one way or another, and the author would be happy to provide more information[3].

RECOMMENDATIONS

1. Closer relationship between insurers, academics, and government, to share data, research, and expertise.

2. Aim for a pro-active instead of purely reactive approach to spread a culture of prevention and preparedness through making resilience an essential part of sustainability.

3. Ensure development work does not increase vulnerability or exposure to natural hazards.

4. Recognise the role that could be played by the insurance industry through UNEP-FI and UN-ISDR, in influencing behaviour through premium incentives, and spreading the costs of disasters onto the global economy through reinsurance.

5. Use insurance industry data to assist with reducing vulnerability.

6. Promote Contraction and Convergence as a long term solution to climate change issues.

Professor David Crichton
Chartered Insurance Practitioner,
Visiting Professor at Benfield Greig Hazard Research Centre, and Middlesex University Flood Hazard Research Centre, and Research Fellow at the University of Dundee

February 2002

---

[2] Of which the author is a member.

[3] The author is also a member of the UK Research Councils' Earth Observation Expert Group and the DTI's Earth Observation Programme Board.

REFERENCES

Crichton, 1999a

David Crichton, *"The Risk Triangle"* published in *"Natural Disaster Management"* Editor Jon Ingleton, Tudor Rose, London, 1999, ISBN 0 9536140 0 X.

Crichton, 1999b

David Crichton, *"Flood Appraisal Groups, NPPG 7, and Insurance"* Paper presented at a seminar entitled "Flood Issues in Scotland", Dec. 1998, organised by SEPA and CoSLA, SEPA, Stirling, 1999.

Crichton, 2001a

David Crichton, *"The Implications of Climate Change for the Insurance Industry"* Building Research Establishment, Watford, November 2001. ISBN 1-903852-00-5.

Crichton, 2001b

David Crichton, quoted in *"The Economist"*, London, 17 November 2001, p 34.

Davis, 2002

Prof Ian Davis, Cranfield Disaster Management Centre, *"Earthquake Mitigation"* in press, 2002.

Garvin et al, 1998

S L Garvin, M C Phillipson, C H Sanders, C S Hayles, and G T Dow *"Impact of climate change on building"*, (ISBN 1 86081 237 6) Building Research Establishment, East Kilbride, 1998.

Munich Re, 2000

"Topics 2000". Published January 2000.

Retallack, 2001

Simon Retallack, Managing Editor *"The Ecologist"* "We've saved Kyoto (shame about the world's climate)" Ecologist Report, London, November 2001 pp18-22.

WEB SITES FOR ADDITIONAL INFORMATION

Association of British Insurers (ABI)
http://www.abi.org.uk

ABI Guidelines on Socially Responsible Investment
http://www.ivis.computasoft.com/

Building Research Establishment (BRE)
http://www.bre.co.uk

British National Space Centre (BNSC) includes information on GIFTSS
http://www.bnsc.gov.uk

Commonwealth Disaster Management Agency
http://www.commonwealthdma.com

Construction Industry Research and Information Association (CIRIA)
http://www.ciria.org.uk

Earthwatch initiative (UN)
http://earthwatch.unep.net/

Global Commons Institute (Contains details of Contraction and Convergence.)
http://www.gci.org.uk/main.html

Global Monitoring For Environment And Security
http://gmes.jrc.it

Livelihoods and disaster reduction
http://www.livelihoods.org/

Munich Reinsurance (Publishes a great deal of useful information and statistics.)
http://www.munichre.de

Natural and Environmental Disaster Information Exchange System (NEDIES)
http://nedies.jrc.it/home.htm

UNEP Finance Initiative and The Insurance Industry Initiative for the Environment
http://unepfi.net/iii/index.htm

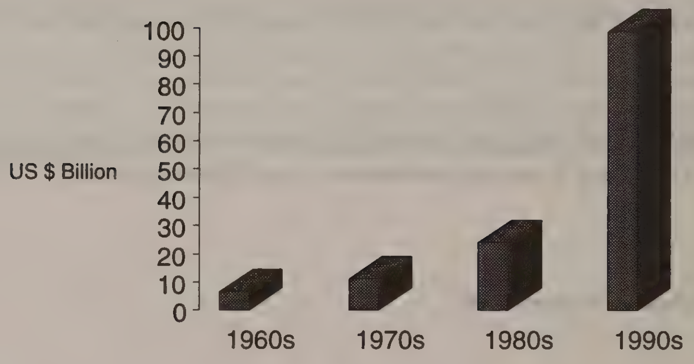
United Nations International Strategy for Disaster Reduction (UNISDR).
http://www.unisdr.org/

Appendix

Figure 1

World wide insurance losses

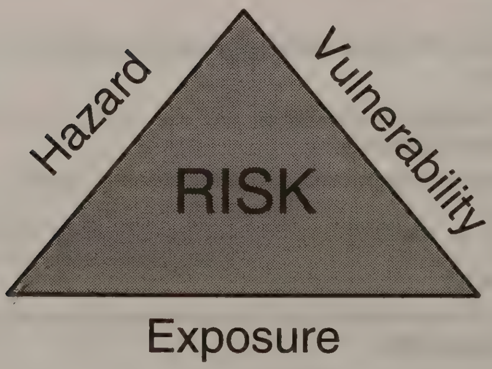
Natural Catastrophe Losses - Decadal Totals



Source: Munich Re, January 2000

Figure 2

The Risk Triangle
A Framework for Adaptation?



Source: Crichton (1999)

APPENDIX 13

Memorandum submitted by Julie Ukeje, Assistant Director (Climate Services), Department of Meteorological Services, Federal Ministry of Aviation, Abuja, Nigeria

THE POTENTIAL IMPACT OF GLOBAL CLIMATE CHANGE ON DEVELOPMENT AND DEVELOPING COUNTRIES: THE NIGERIAN SITUATION

1. Introduction

Climate change and climate variability such as failure of expected normal seasonal changes or extreme climate conditions like drought, global warming, severe flooding and sea level rise have significant impact on society particularly in developing countries like Nigeria due largely to the limited resources to mitigate these impacts or provide rapid relief when the associated disasters occur. In addition, in a bid to counter poverty and other socio-economic problems arising from their teeming populations, rapid development and urbanization have become imperative and these are often conducted in an unsustainable manner. In Nigeria for example, the "oil boom" of the 1970s resulted in massive movement of the populace to the urban areas in search of white-collar jobs, giving rise to increased burning of fossil fuels, large deforestation etc. that in turn aggravates global climate change problems.

In Nigeria, the greatest impact of climate change is in the areas of agriculture, fresh water resources, coastal zone management, ecosystem, energy and human settlements as reflected in decreasing agricultural yields, atmospheric and water pollution and shortage of available fresh water. Other consequences include environmental degradations such as loss of massive arable and habitable land to coastal and gully erosions in the south and to drought and desertification in the north, rendering thousands of people homeless. These have adversely affected food, water and energy supplies, thus slowing down and sometimes reversing developmental processes. Mostly affected are the inhabitants of the rural areas who depend mainly on agriculture for livelihood.

Climate change when related to the rapidly growing population of the country could also result in serious socio-political tensions, even leading to internal security consequences over diminishing fresh water resources and fertile land for grazing and agricultural activities. Common conflicts include fights between cattle rearers and farmers in the north and inter-communal wars in the south over fertile lands.

Apart from disasters arising from drought in the Sudano-Sahelian regions, flood disasters are the most rampart in the country in recent decades. In the Sudano-Sahelian drought of 1968 and that of 1972–73, about 300,000 animals representing 13 per cent of the livestock population of the north-eastern Nigeria were estimated to have died, and it reduced agricultural yields to between 12 per cent and 40 per cent of the annual averages. In the case of flooding at least 20 per cent of the population is at risk from one form of flooding or another, ranging from the rich urban residents of Victoria Island, Lagos to poor farmers and fishermen in Benue / Niger trough and the coastal region of the country. An average of about 100 people are killed and millions of naira worth of property damaged by heavy rainstorm and flood each year. Analysis of the reports of weather disasters from 26 states of the federation shows that about 70 per cent of the damages incurred from weather disasters in 1993 (which totaled about 3.64 billion naira) was caused by rainfall-related hazards. The figure rose to about 85 per cent in 1994 (with total loss of about 8.3 billion naira). Just as earlier stated, most of the disasters have serious adverse impact on the nation's economy particularly on food supply. The 1993 record alone destroyed 887 acres of farmland, and 11,339 buildings. In 1999, the estimated cost of rehabilitating or replacing damaged infrastructures resulting from just rainfall-related disasters was put at about 50 billion naira. The destructions include colossal losses in farm produce as 12 million hectares of farmlands were washed away which was another catastrophe to food supply.

Weather extremes like severe storms, harmattan haze and excessive heat have also caused a lot of havoc in the country. Examples of these are the recent unusual wide spread storm with maximum gust of over 90 knots on 27 March 2002 at the Abuja airport which destroyed some parked planes and several buildings and the poor visibilities arising from harmattan dust haze cum dry spells which often result in cancellation of flights and sometimes air crash and fire incidences from the dry harmattan winds. There is also the belief that the last 27 January bomb blast at Lagos was caused by chemical reactions, which could have been triggered off by excessive heat and humidity over the years.

2. Sectoral Potential Impact of Climate Change and Mitigating Efforts in Nigeria

Areas that are most vulnerable to disasters emanating from climate change in Nigeria include (a) the low-lying islands, (b) the mangroves, (c) the coastal wetlands and grasslands, (d) the semi-arid and arid areas, and (e) rivers, lakes.

The greater and faster these vulnerable areas get impacted by climate change, the more the damages to the ecosystem, the human societies and the social cum economic developmental processes that depend on them. This is the case with the following sectors of the nation's economy namely; the coastal zone resources, agricultural and food production, water resources and energy sectors:

2.1 *Coastal Resources*

The Nigerian coastline forms an important base of socio-economic development of the nation. The Nigerian coastal zone lies within latitude 4° 10' to 6° 20' N and longitude 2°45' to 8° 35'E spanning about 850 km of low-lying coastline, with estimated human population of over 20 million. The zone consists of four distinct geomorphologic parts namely:

(a) The Barrier-lagoon system in the west;

(b) The Mahin transgressive mud coast;

(c) The Niger-Delta covering about 20,000 square kilometre which is the second largest delta in the world. It spans a coastline of 450 km and has the largest mangrove swamps in Africa estimated at 1,900 square km; and

(d) The Strand coast in the east.

The coastal zone encompasses more than six cities including Lagos (the former capital of the country) and PortHarcourt; both of which are main air links of the country to the outside world. The zone houses about 50 per cent of the industries in the country including the oil and gas industries, which represent 90 per cent of Nigeria's source of foreign exchange.

The oil investment in the Niger Delta has been estimated to be in excess of 13 billion US dollars. The zone also accounts for almost 50 per cent of the artisanal fishery resources in the country. Other minerals in the coastal zone include sand used for construction of houses and beach nourishment and bitumen or tar sands.

2.1.1 *Present and Projected Climate Change Impact on the Coastal Resources*

The main climate disaster that affects the Nigerian coastline, ports and harbours activities is flooding from sea level rise resulting from storm surges and changes in the wave climate especially during the months of April to October which coincides with the period of high spring tides. From 1985 to date, there have been 14 cases of storm surges. Temporal distribution of the sea surface temperature over the coast of Lagos in the past one decade suggests an annual fluctuation with pronounced warming of the sea in 1995 and 1998; corresponding to years of global warming. Notable potential impacts of these are:

(i) Loss of farmlands and coastal infrastructures to coastal erosion and flooding. For example, the Bar beach in Victoria Island, Lagos (the most popular beach in Nigeria), which was about 1,500 metres from the adjoining Ahmadu Bello Way (in Victoria Island, Lagos) in 1964, was reduced to less than 200m in 1976. The beach has virtually taken over one lane of the said dual-carriage way due to coastal erosion. The estimated annual rate of land loss at this beach is about 30 to 40 metres. The other beaches at Mahin, Forcados, and Brass, respectively loose about, 20 to 30 metres, 20 metres, and 16 to 20 metres of land to coastal erosion yearly. In fact Nigeria has been identified by UNEP and IPCC as one of the most vulnerable African countries to inundation from sea level rise with serious environmental and socio-economic impacts. This is further aggravated by the vulnerable soil characteristics and low-lying topography of the coastal area coupled with some anthropogenic practices like construction of harbour protecting structures, oil and gas exploration and exploitation.

(ii) Decimation of the coastal vegetation especially the mangroves and the recreational areas.

(iii) Increased salination of both ground and surface water leading to deaths of plants and animals, thus adversely affecting agriculture, water supply as well as coastal industries especially fish production.

(iv) Considerable loss of coconut trees and palm tress which in the past two decades dominated the bar beach.

(v) Displacement of coastal settlements, particularly in August 1995 and 1999 when most people at the beach had to be evacuated.

(vi) Loss of more than 200 industrial establishments worth over 45 billion US dollars is likely, due to a projected sea level rise of 0.5m from a temperature increase of 1.5°C to 2.0°C which might result to inundation of 150 square kilometer of land in the Eti Osa local government areas in Lagos state.

Studies by the Nigerian Institute for Ocean and Marine Research (NIOMR) reveal that the barrier lagoon coastline in the western extremity housing the high real estate at Victoria Island and Lekki in Lagos could lose well over 584 and 602 square kilometre of land from erosion, and inundation could completely submerge the entire Lekki barrier system. Such adverse impacts will affect the residential, commercial and tourist facilities (in these areas), which are valued at well over 12 billion US dollars. Already, an occurrence of 0.2 metre of sea level rise resulted to a loss of 3,400 square kilometres of landmass to flooding. This is projected to affect about 18,400 square kilometres of land with a 1m sea level rise.

The same study also shows that, with a sea level rise of 0.3 metre, about 1 to 2 million people out of the total population of 6 million in the Niger delta area of the coastal zone will be displaced and require relocation, while a sea level rise of 1 metre will affect 2 to 3 million people in the same area. The Strand coast on the eastern extremity shares the same fate, as about 400 square kilometres of its land would be lost to inundation by the year 2100.

Given the dense population and the above suite of socio-economic activities of the coast especially the billions of US dollars worth of oil mining facilities, the potential loss to Nigeria as a result of such climate extremities will be very great and perhaps irreversible.

2.1.2 *Mitigating and Combating Measures*

To mitigate the negative impact of climate change on the socio-economic activities in the coastal zone, the under listed actions have been embarked upon:

(i) Provision of Early Warning System (EWS) by the department of Meteorological Services through its Marine unit in the following ways:

- use of a parametric wave model to predict five to seven days ahead the wave height and period of any expected surge; and
- use of a "Stati" package which utilizes the existing pressure values and tidal gauge measurements to determine the characteristics of these elements especially before, during and after the surge.

(ii) About eight (8) sand nourishment projects have been implemented on the bar beach since 1958 to act as a stop gap combating measures to the fast deteriorating erosion problem of the beach. In 1990, about 300 million naira was spent to deposit sand on the Victoria Island beach in Lagos, and about 85 million naira sand filling and shore protection projects were carried out at Aban-Ama and environs of Okrika in River state. Due to ineffectiveness of these measure, the nation is considering putting in place concrete wall structures as is being practiced in places like the Netherlands, Denmark and Germany. In this regard, discussions are being held with some international consulting firms on more effective shoreline protection technology.

(iii) Enactment of some conservation legislations like:

- The exclusive Economic Zone decree of 1978;
- The endangered species decree of 1985;
- The natural resource conservation council decree of 1989;
- The Sea Fisheries decree of 1992.

(iv) Setting up of several national committees on climate and environmental related issues eg the Ecological committee, the national committee on Climate change, the national committee on sustainability Science, the technical committee on erosion and flood control and the Niger Delta Development Commission.

(v) Creation of the Federal Environmental Protection Agency (FEPA) in 1988 (now in the Federal Ministry of Environment) to inter alia maintain and improve the quality of the unique environment resource endowment and physical characteristics of the coastal areas and prepare ecological master plans to guide the use of coastal areas for diverse and often conflicting individual and social activities for the continuous viability of all aspects of the ecosystem.

Nigeria is also actively engaged in global and international efforts to ensure sustainable development in a bid to mitigate these adverse impacts of climate change. She became party to the 1958 Geneva Convention of territorial Sea and Continent Shelf on 10 October 1964, and 28 May 1971 respectively. The United Nations Law of the Sea was signed on 10 December 1982 and ratified on 14 August 1986.

2.2 *Agriculture*

The agricultural sector is about the largest sector of the nation's economy as it contributes about 37 per cent of the GDP and provides employment for about 65 per cent of the adult labour force. In addition to being the main food source, it also provides raw materials for the agro-allied industrial sectors and ranks next to the oil sector as a source of foreign exchange earning for the nation. Thus any variation in climate especially in rainfall is a potential threat to food security and agro-allied industries as the nation's agriculture is mostly rain-fed.

2.2.1 *Potential Climate Change Hazards on the Agriculture and Food Sector*

The potential impact of climate change on the agricultural sector includes:

- Reduction of soil moisture availability and run-off;
- Inadequate rainfall and sources of irrigation;
- Degradation of lands as a result of drought and desertification, which subsequently become prone to locust and pests invasion causing untold havoc to crops;
- Loss of arable lands due to floods and erosions especially in the southeastern part of the country where there is severe cases of gully erosions. The main implication of this is increased cost of

transportation due to destruction of the roads by the gully erosions, which in turn results in hikes in the prices of foodstuffs.

Like most other developing countries, these potential climate change hazards are further aggravated by some environmental unfriendly anthropogenic practices such as:

- Excessive use of fuel woods and charcoals and bushfires which have led to rapid disappearing of tropical forests resulting in deforestation, as the fuel woods removal rate exceeds its replacement.
- Urbanization and increased livestock grazing activities, which have caused loss of arable lands thereby moving the limit of production into marginal lands.
- Over-use of fertilizers and pesticides.
- Large-scale expansion of irrigated agriculture has met with increasing problem of waterlogging and salinization, further worsening the desertification problem.
- Vegetation degradation due to persistent bush burning from fires started in extreme dry weather conditions and perhaps intensive grazing.

2.2.2 *Mitigating Efforts*

Some actions taken by the government to fight the above problems are:

- Raising agricultural productivity to ensure food supply and keep in pace with increased population and urbanization so as to achieve by year 2010, an average of per capita level daily energy supply of 2900kcal. The nation's agricultural productivity programs include:
  (i) The Agricultural Development Programme;
  (ii) The National Fadama Development Program;
  (iii) The National Agricultural Technology Support Program;
  (iv) The National Japanese Assisted Rice Production Program and other related programmes.
- Expanding the production of export crops to increase and further diversify foreign exchange earnings.
- Stepping up the harnessing of large rivers.
- Undertaking large-scale capital construction projects of farmlands.
- Improving agricultural fields with low grain production.
- Undertaking comprehensive agricultural cultivation projects.
- Increasing the supply of agricultural raw materials for domestic manufacturing activities.
- Improving institutional and administration support capacity.

The Meteorological Services Department has also contributed to the support of food security in the nation through expansion of her agricultural station network, development of crop/weather models and indices in aid of the judicious use of crops and ecology for sustainable agriculture, and establishment of Agric. Meteorological Early Warning System (EWS). Some of the information and products from the Agric EWS are onset and cessation of the rainy season, outlook for onset of drought, vegetation index maps, etc.

2.3 *Fresh Water Resources*

Fresh water resources in the country are quite enormous; surface and groundwater resources of over 250 billion cubic metres, with rivers Niger (the sixth largest and longest river the world) and Benue as well as Lake Chad being the prominent sources. There are also over 10 active River basins complemented with increasingly vital exploitation of ground water nationwide, particularly to meet the water needs of the rural communities.

Water is critically important for most socio-economic development activities. Thus the impact from extreme weather events like drought or from human induced climate change hazards eg pollution, salinization and overgrazing could have far reaching consequences on the nation's socio-economic development. For example, the Kainji dam (mainly drained by the River Niger) which was hitherto the best viable economical alternative means of electricity generation since it is not restricted in purpose, is now threatened by variations in rainfall and evaporation. This in turn affect hydroelectricity generation leading to erratic power failures in the country.

2.3.1 *Potential Impacts*

Other impacts of climate change on this sector include:

- Fast shrinking of lake Chad due to desertification and aridity as well as the southward movement of the sand dunes. Two thirds of the lake has shrunk over the years from 25,000 square kilometre to 12,000 square kilometre since 1972, thus making water resource management even more difficult as river channels are also drying up. Consequently water availability per inhabitant per year is expected to decrease from 3,100 cubic metre in 1990 to 1,600 cubic metre by the year 2025. Other consequences of this include reduction in fish catches.

- Threat to the employment of more than 5,000 farming families whom the lake provides source of water for their over 50,000 tonnes of rice, 30,000 tonnes of wheat and 10,000 tonnes of seed cotton farmlands.
- Threat to the 260 million US dollars yearly revenue usually generated from agricultural, animal and fish production at this area.
- Likelihood of an intensification of the global hydrological cycle that can affect the frequency and intensification of floods and drought.

2.3.2 *Mitigating Efforts*

- Channeling of water from the Congo River in the Democratic republic of Congo through the Ubangi River in Central Africa Republic which drains into the River Congo and Chari River which in turn enters the lake as the best option for replenishing the dwindling resource of lake Chad. This will be through joint efforts of the members of the Chad Basin Commission made up of Nigeria, Niger Chad and Cameroon.
- Ensuring comprehensive assessments of water resources with a view to arresting water pollution and enforcing standards and regulations.

2.4 *Health Sector*

In Nigeria, extreme values of weather parameters such as temperature, relative humidity, and rainfall have led to severe human health problems. For example there is now expansion of vector-borne diseases like malaria and cholera due to frequent flood episodes and outbreaks of Cerebro-spinal Meningitis due to heat stress from the rising temperature profile.

Again, some of the environmental unfriendly human practices such as air and water pollution have also resulted to other health problems such as respiratory diseases. It has been observed that health hazards resulting from such problems have increased since over the last 10 years due to rapid industrialization and its consequent emissions, effluent and waste management.

There is also the "poverty factor" (ie sicknesses following undernourishment from food shortage); the poverty level increased from 42.7 per cent in 1962 to 65.6 per cent in 1996, with the number of people in poverty increasing from 39.7 million in 1992 to 67.1 million in 1996 (ie using two third mean per capita household expenditure to indicate poverty line).

2.4.1 *Mitigating Efforts*

Nigeria is actively involved in many of the global health programs like the Roll Back Malaria (RBM) programme, the Immunization program, etc. The country has also launched the National Poverty Alleviation Program (PAP).

2.5 *Energy*

This sector controls almost all facets of the country's economic and developmental activities particularly through the provision of electricity and fuel supply for residential and commercial uses, transportation, agro-processing industries and large and small-scale industries. Although Nigerian is endowed with a wide range of both non-renewable and renewable energy resources, most of the above energy requirements are met by the non-renewable sources especially the fossil fuels which pose serious threat to the atmosphere and sustainable development through their emission of Green House Gases (GHG). Moreover there is a lot of pressure on this sector due to the increasing population. It has been estimated that the demand for energy in the country could increase by 20,000 MW in the next decade.

2.5.1 *Potential Climate Change Hazard*

Apart from the damages to electrical power installations due to severe thunderstorms and lightning, water shortage in the hydropower sources as a result of drought, and over flow of the hydropower dams in the event of floods, the concern here is how the subsequent environmental pollution and increased GHG from the above anthropogenic practices in this sector result in and exacerbates climate change hazards as shown below:

- Increasing use of woodlands for fuel, which in turn lead to large-scale deforestation; it is estimated that over 90 per cent of rural households and the poor urban households depend on fuel wood for domestic energy needs. Although there is a considerable uncertainty with regard to the quantity of wood consumed in the country, some estimates put it at about 51 to 88 million cubic metres per annum with about 80 per cent of this being consumed as fuel wood. It has also been estimated that about 15 per cent of Nigeria is being besieged by severe deforestation as about 92,000 hectares of woodlands in the northern part of the country and about 350 thousand hectares in the entire country are deforested annually. The value of the lost forest has been conservatively estimated at 750 million US dollars annually. Consequently, the nation's 15 million hectares of forest and woodland reserves could be depleted within the next 50 years if the current trend is not checked.

- Gas flaring of over 70 per cent of the associated gas produced in the oil fields (more than about 26 billion cubic metre of natural gas is flared annually amounting to loss of billions of US dollars in the past 30 years); this has been identified as the major contributor to environmental pollution and source of GHG emission.
- Oil-spillage in the oil-producing areas; about 155 incidences of this involving 21,448 barrels of oil was reported in 2001 alone. These have resulted in destruction of land cum vegetation and water leading to loss of biodiversity eg declining agricultural yields / qualities, pollution of streams and rivers and loss of jobs for fish farmers.
- Increase of pollutants in the atmosphere especially at the oil-producing areas, which in turn lead to acidic and highly polluted rainwater. This is evident from the surface ozone record at a background pollution station located at Oshogbo (near Lagos), which gave the pH value of rain as 5.6 to 6.0 (less than 7.0, which is the value for a neutral solution).
- High values of total ozone observed in the stratospheric ozone station at Lagos, (253 Dobson unit (DU) as compared with the mean value of 240DU over the equatorial belt) could pose a potential threat to the preservation of the stratospheric ozone in the area.

2.5.2 *Mitigating Efforts*

The country in a bid to mitigate the above impact has taken some measures, which include:

- Ensuring regular supply of alternative to fuel wood by way of enhanced supply of coal popularization of biogas and biofertilizer plants, promotion of the use of wood shaven, agricultural wastes and / sawdust as briquettes and the support and development of other renewable energy sources.
- The use of solar power for pumping water and lighting in rural areas.
- Introduction of Liquefied Petroleum Gas (LPG) and Kerosene stoves as alternatives to fuel wood in rural and urban areas.
- Removal of subsidies on petroleum products with a view to enhancing growth of renewable sources of energy
- Increased awareness of energy-related environmental degradation cum climate change, which is believed, will cause a shift to market development of renewable energy resources and promotion of the use of abundant natural gas. Fallouts of this include the Liquefied Natural Gas (LNG) project, the West Africa Gas Pipeline project and the Associated Gas Utilization Fiscal Incentive (AGUFI).
- Government ultimatum to stop gas flaring by year 2008.
- Introduction of energy efficiency programmes namely (a) the industrial energy efficiency programme, (b) the energy efficiency in building and (c) the energy efficiency in the transport sector.
- Shift from high carbon to low carbon fuels and improved productivity.

The energy and industrial sector is one area most affected by the United Nation Framework on Convention for Climate Change (UNFCCC) (ratified by Nigeria in 1994), the Kyoto Protocol on Climate Change and the Montreal Protocol. Issues on the implementation of the convention is merely that of GHG emission which are principally from the use of fossil fuels while their sinks (particularly carbon dioxide) are considerably being lost via land use changes (deforestation). It is envisaged that reduction in the consumption of fossil fuel by developed countries (the main thrust of the Kyoto protocol) will adversely affect the country's economy being largely dependent on fossil fuel production for its revenue. This will also hamper her efforts to achieve the "first and overriding priorities of eradication of poverty and achievement of socio-economic development. . ." as expressly recognized by the convention.

The issue of concern here is meeting the obligation of providing carbon sinks and at the same time improving her fragile economy by promoting both agro forestry and non-economic forestry.

For the project on alternative to fuel wood, there is dearth of trained personnel to handle the design, manufacture, marketing and operating and manufacturing of the renewable energy system with abundant sources of renewable energy (solar, wind, biomass, small scale hydro etc). The Energy Commission of Nigeria (ECN) in cooperation with UNESCO started the training of technicians and artisans on the installation and maintenance of solar power system in 2001. A Country Service Framework (CSF) is also being implemented for small and medium scale industries on energy efficiency by the ECN, UNIDO and the Federal Ministry of Industries.

The Environment Monitoring body (ie the Federal Ministry of Environment) is also making efforts to effect a downward trend of the above environmental hazards from this sector in accordance with the UNFCCC requirements especially through improved fuel efficiency and reliance on carbon intensive fuels which requires technology transfer. Thus bringing to the fore the relevance of the Clean Development Mechanism (CDM) of article 12 of the Kyoto Protocol. Already the country has a joint project with Canada on Climate Change capacity Development.

The new political status of the country especially in her determination to achieve economic growth and poverty eradication surely contributed to this positive development. Some of the achievements made in this aspect include:

- Organization of seminars and workshops on building capacity to Facilitate CDM projects in the Oil and Gas and Manufacturing sectors of the Nigerian economy.
- Development of a country program for the implementation of the Montreal Protocol for the phasing out of the Chloroform Carbon (CFC); over 10 private companies have benefited from the retrofitting of their factories for refrigerant manufacture, human resources development and funding of CFC phase-out programmes under the Multilateral Fund (MFMP) while 10 companies were supported to retrofit foam manufacture.
- Establishment of pilot and demonstrative projects on solar-PV, biogas improved wood stove, solar drying and other thermal application being carried out by the government in various states of the federation with allocation eg 2 tonnes per cycle Ada Rice Solar dryer project in Enugu / Anambra state, the solar PV water pumping sheme, the Kwalkwalewa village solar PV lighting system project in Sokoto state and the Ojokoro cooperative Agricultural Multipurpose Society 20 m3 Biogas project in Lagos state.
- Setting up of a CDM center at Ibadan, and joint establishment of a 5-year framework (Country Service Framework (CSF)) for technological assistance for industrial development in the country by UNIDO and Nigeria. The CSF includes a programme on Environment and energy whose objective includes (a) the energy management in industry and mobilization capacity to enable industrial projects under the CDM, (b) creating enabling environment necessary for CDM projects namely the Industrial Policy with the focus on Public Private Partnership.
- Establishment of more poverty alleviation projects to further reduce the dependency on the forests for the livelihood of the rural populace.

3. POTENTIAL LINKAGES BETWEEN ADAPTATIONS TO CLIMATE CHANGE AND INTERNATIONAL CONVENTIONS AND PLANNING PROCESSES

(i) *Vienna Convention for Protection of the Ozone layer:* A National Action Plan was developed following its ratification on 17th February 1967.

(ii) *Convention on Biodiversity:* In addition to the development of the National Action Plan, projects on the identification and inventorisation of flora and fauna in all Nigerian ecosystems and increasing the network on protected areas are being embarked upon. The convention was ratified on 29 August 1994.

(iii) *Convention to Combat Desertification:* Also apart from the development of National Action Plan, there are tree-planting campaign, and establishment of shelterbelts. Other projects include afforestation and fuel substitution programme, harmonization and integration of sectoral programmes. This was also ratified on 29th August 1994.

(iv) *United Nations' Framework on Climate Change (UNFCCC) & The Kyoto Protocol:* Most of the actions taken in these two areas have been mentioned under the energy sector, which as a matter of fact is the main focus of the convention and the protocol. With respect to the convention which has already been ratified since 1994, a National Communication is being prepared. The nation is also developing her national Agenda 21 which is taking cognizance of both the global and specific needs of the country including actions for sustainable development. Though the protocol is yet to be ratified, efforts are being made on the identification and inventorization of emission sources of Green House Gases. There are also a few projects on how the nation can fulfill her UNFCCC commitments and also benefit from some mechanisms of the protocol such as the Clean Development Mechanism (CDM), and Emission Trading (ET).

(v) *Montreal Protocol on Substances that Deplete the Stratospheric Ozone Layer:* This was ratified on 23rd July 2001. Actions taken in this regard are the identification and inventorization of Ozone Depleting Substances (ODS) and phase-out programmes on ODS (as already mentioned above) including technology transfer and capacity building.

4. IMPACTS OF RESPONSE-MEASURES

The issue of energy is the main problem generating controversies in negotiations at the UNFCCC meetings and delay in ratifying the Kyoto Protocol by most countries including Nigeria with some developed countries like the USA still dragging their feet in ratifying the protocol. Though climate change naturally affects the output of hydro dams adversely especially during drought and sometimes paralyses socio-economic activities as a result of storm and flood damages to electrical installations, the impact of response-measures (ie via the implementation of the convention and protocols) would be very much felt by the country. This is largely due to the fact that the country practically depends on fossil fuels-driven energy generating technologies, with oil and gas constituting about 80 per cent to 90 per cent of her foreign earnings. Other impacts of the response measures are on the rural area dwellers who live in abject poverty partly because of little or no energy supply ie commercial energy consumption perception which has been known to affect life expectancy, infant mortality, literacy and total fertility.

5. Benefits of Climate Change in Nigeria

Despite the above adverse impact of global climate change, a few benefits can be identified as follows:

(a) The present challenges to the energy sector with regard to embarking on projects that would improve the energy system as enumerated earlier can be seen as positive effects of climate change in the country.

(b) Such projects are also envisaged to provide job opportunities like is the case in Brazil where the preparation of ethanol from sugar cane created 700,000 jobs in the countryside.

(c) The longer dry spells within the rainy seasons as a result of recent variations in rainfall amount and distribution especially in the south now allow exhibitions and other outdoor jobs cum activities which are often disrupted by rain particularly in Lagos to thrive better.

On the other hand the northern areas seem to have been enjoying gradual increase in rainfall both in duration and spread particularly within the past 5 to 10 years. This has given rise to more agricultural production especially for crops like the normal beans specie which hitherto was not planted due to inadequate rainfall but are now being cultivated. This normal specie of beans is usually preferred because of its greater yields than those of the climate-adapted (only 45-days) specie (developed for the shorter rainfall duration).

6. Conclusions

Climate change impact is very rapid over the country and thus makes adaptability very difficult considering also the fragile economy of the nation. The earlier mentioned record of socio-economic losses incurred as a result of extreme weather conditions shows increasing trend in the financial losses. From just 650 million naira in 1988, through 3.64 billion in 1993, and 8.3 billion naira in 1994, the losses rose to 50 billion naira in 1999. The implication of this on the nation's poverty level becomes more terrible when compared with the nation's GDP especially for 1999 when these losses accounted for about 41 per cent of the GDP. This in fact is the main problem ie inadequate resources to cope with climate change impact whereas this poses little or no problem for the developed countries like the USA whose losses from weather and climate disasters last year though was as high as 9.8 trillion dollars only translated to 0.08 per cent of her GNDP.

No doubt, climate sits at the nexus of the two principal development concerns namely; poverty and sustainability development. Efforts to better understand the role of the climate on society and to develop ways to manage climate impact especially through improving climate prediction techniques must therefore contribute to key development objectives. Enhancing developing countries' capacity especially Nigeria's for research and systematic weather observation thus forms one of the focal points of negotiation at the several meetings of the convention on climate change. The current step by the Federal Government to grant autonomy to the Nigerian Meteorological Services Department could not have come at a better time as this will considerably enhance the Department's performance in the area of acquisition of the modern technologies and capacity building particularly in the development of Local Area Model (LAM) which has a higher resolution that is able to capture the small-scale weather motion which are the most important weather features over the country, but which are usually filtered out by the global Numerical Weather Prediction (NWP) models currently employed.

Judging from all the earlier stated national actions taken, it is apparent that Nigeria is very concerned about the safety of its environment. In fact, Nigeria more than any other developing country is very anxious to mitigate climate change as it has a lot at stake particularly in the area of reduction of consumption of carbon fuels which is its main source of foreign exchange. With over 25 billion barrels of national oil reserves and about 23 million barrels per day production capacity, the nation (which ranks among the world's top 10 oil producing nations) should be able to cope with her population by effectively financing her development programmes and alleviating poverty.

However it is sad to note that because of lack of adequate gas utilization, most of the gas produced in association with this oil is flared. For example each barrel of oil produced is just a tenth of the gas equivalent, which as earlier stated contributes to climate change via pollution and emission of greenhouse gases. Though several schemes on oil utilization have been initiated to realize the 2008 deadline on gas-flaring, the country needs further assistance from the developed countries not only in this regard but also on other energy efficiency programmes.

From the above issues raised, the country has no doubt fared reasonably well in the management of global climate change problems despite her fragile economy and poverty level. It is for this latter principal developmental concern (ie poverty) that the country will have to reflect critically on whether or not to ratify the Kyoto Protocol. It has to consider the potential economic losses that may arise from the full implementation of the protocol as discussed above as against the environmental gains or safety from climate change mitigation. In effect, Nigeria has to strive a balance between her socio-economic interests and protection of her environment.

Julie Ukeje
Assistant Director (Climate Services),
Department of Meteorological Services,
Federal Ministry of Aviation, Abuja, Nigeria

April 2002

REFERENCES

Aina, T. A. *et al,* 1992: The Challenges of Sustainable Development in Nigeria (An NGO Report prepared for the United Nations Conference on Environment and Development, Rio de Janeiro, Brazil 1–12 June 1992.

Awosika, L. F. *et al,* 1992: Impact of Sea Level Rise on the Coastline of Nigeria using Aerial Videotape Assisted Vulnerability Analysis (AVVA) technique coupled with Ground truth data: A project funded by Environment Protection Agency of USA and executed by NIOMR and laboratory for coastal Research of the University of Maryland USA.

Awosika, L. F. (1993): The Nigerian Coast: Addressing the Coastal Impact of Climate Change through Integrated Coastal Zone Management: Proceedings of World Coast Conference Vol 2 pp 803–812.

Cornford, S. G. 2001: Human and Economic Impacts of Weather Events in 2000, WMO Bulletin Vol 50 No 4, pp 284–300.

Ibe, A. C. (1988): Coastal erosion in Nigeria: Ibadan University Press pp 217.

Ibe, A. C. 1990: Global Climate Change and the variability of the Nigerian Coastal Zone to Accelerated Sea-Level Rise: Impacts and Response Measures: Lecture delivered at the first Federal Ministry of Science and Technology's monthly Seminar.

Nigerian Environmental Study/Action Team (NEST), 1991: Nigerian's Threatened Environment-A National Profile.

Obioh, I. B and Oluwale A. F 1994: National Inventory of Air Pollutants in Nigeria: Emissions for 1988.

O Cornford, S. G. 2001: Human and Economic Impacts of Weather Events in 2000, WMO Bulletin Vol 50 No 4, pp 284–300.

Oguntoyibo, J. S. *et al,* 1989: Meteorological Hazards and Developments (Proceedings of the International Symposium on Meteorological Hazards and Developments Held in Lagos and Kano, Nigeria 23–31 October 1989.

Ojo, S. O. 1986: Drought Persistence in Tropical Africa since 1969:
Programme on Long-range Forecast Research, WMO Report series No 6 Vol I WMO/TD 87, pp 73–85.

Ukeje, J. E. and Alozie, J. E. 1995: Coping with Weather Hazards: A Cost-Benefit Analysis of the Nigerian Weather Forecasting Services: Proceeding of the International Conference the Implication of Climate Change, Global Warming and Environmental Degradation in Africa organized by the Nigerian Meteorological Society 1995.

United Nations System in Nigeria, March 2001: Nigeria Common Country Assessment.

World Climate News No 12, 1998: Regional Effects of Climate Change on Coastal Areas.

APPENDIX 14

Memorandum submitted by the World Meteorological Organization

INTRODUCTION

This paper focuses on the role of climate data in the context of sustainable development. It emphasizes the value of accurate atmospheric/climate data of long duration and continuity. The World Meteorological Organization has the responsibility, within the United Nations System, for observational data on climate including standardization of techniques, and data quality and record length. It has other responsibilities in important areas of climate services and application.

Sustainable Development

Sustainable development is understood differently in different countries/cultures. The central idea, however, revolves around elevating the standard of living and, hand-in-hand, improving the quality of life in all regions of the world. Wealth creation through such measures as productivity increases and the equitable sharing of the wealth across society is at the heart of the first aspect. Environmental and social well-being, state of public health and education and availability of discretionary/leisure time are some of the issues that lie at the root of the second aspect.

Climate Change and Sustainable Development

The Intergovernmental Panel on Climate Change, which the WMO co-sponsors, concludes in its Third Assessment Report (2001) that human influence is seen in the temperature increase observed over the last 50 years. This has had some consequences such as floods, droughts, severe weather events, El-Nino phenomena. Projections by the IPCC indicate that if the causes of the warming trend continue unabated, the temperature at the end of the century would be between 1.4 to 5.8 deg C. This may be compared to the increase of about 0.6 deg C seen in the last 100 years. Thus, the projected rate is at least twice that observed in the recent past.

Ecological and socio-economic systems are coping, fine-tuned, with the state of the current climate system (including the rate of temperature increase). If that system changes, and climate zones shift poleward/upward as a result of global warming, will the ecological/socio-economic systems have the necessary time and the resilience to adapt and survive? Yes or no, this has implications for sustainable development.

Potential Impacts of Global Warming

The impacts of climate change will be distributed differently in different nations and differently among the different socio-economic sectors of a given nation.

For example, in the current context of global warming, winter deaths due to cold waves could be lower than otherwise; currently-nonproductive lands may become productive in agriculture or as pastures in the marginal regions of the higher latitudes. Enhanced concentration of carbon dioxide in the atmosphere may increase forest biomass. On the other hand, the character of the precipitation and water loss in a warmer world may lead to more floods in some regions and more droughts in other regions; vector-borne diseases may penetrate into regions where they do not do so now; water supply may be affected due to changed seasonality in run-off, quality, increased evapotranspiration and salinization due to salt water intrusion in a rising sea; summer deaths may increase due to added heat stress. Impacts thus could be positive or negative but occurring as they may be in different places and times on varying time and space scales, these are unlikely to compensate each other in the aggregate either within a nation or within a sector. The aggregate impacts would depend upon the magnitude, rate and regional distribution of climate change.

There are potentials for conflict among nations. While the overall cereal supply in the world would be expected to remain little changed, the distribution of the regions of supply and demand would likely change from the current pattern. Coastal inundation and submersion of low-lying areas such as deltas may cause displacement of populations to other regions within the same country or into neighbouring countries, Traditional sharing of waters across political boundaries may be harmed if the supply and demand for quality water shifts. Conflicts, whose seeds are embedded in potential climate change, will not be helpful in meeting sustainable development goals nor will adverse impacts be.

Sensitivity, Adaptive Capacity and Vulnerability

According to the IPCC, all ecological/socio-economic systems are sensitive to the state of the climate system. If adaptation is relatively easy in a system, it can be considered to be not so vulnerable. If adaptation is hard, time-consuming and costly, the system would be more vulnerable to climate change. Thus, vulnerability is a function of sensitivity and adaptive capacity.

An understanding of the vulnerability of a system (such as agriculture, water supply, surface road network, catastrophic insurance) is necessary in order to judge its sustainability.

Almost by definition, all poorer nations, having less adaptive capacity, are more vulnerable than their better-to-do neighbours. Even in a relatively well-to-do nation, the poorer segments of society are more vulnerable, the degree of vulnerability depending on their access to adaptation mechanisms and services.

Estimating Vulnerability

Between sensitivity and adaptive capacity, the two components of vulnerability, adapative capacity depends largely on such characteristics as the availability of financial resources, adequacy of human resources, institutional capability, public awareness and acceptance and access to methods and techniques for adaptation. Many subjective considerations enter into evaluating adaptive capacity.

It is, however, possible to be more quantitative with respect to the sensitivity of a system and to estimate the response of the system in the physical/chemical/biological sense to climate change. The more quantitative one gets, the better the decision-making.

Role of Climate Data

Climate data have two major roles in estimating the response of a system to climate change. From past observed data, statistical relationships and models have been developed that can be used for future projections. The longer the data record and greater the accuracy of the data, the more reliable the statistical relationships/models are. Climate data need also to be projected (by using sophisticated climate prediction models) for the times into the future when the projections of the system response would be desired. The climate prediction and other models use past data for improving and verifying/validating their operation.

Role of the WMO in Ensuring Climate Data

The World Meteorological Organization has established unique networks of observing stations on the global and other scales for observing weather, climate, atmospheric composition and hydrological parameters. The observational methods are standardized, and the observations are fully quality-controlled, made at frequencies varying with the intended use and archived in World Data Centres. Large quantities of data pertain to the three-dimensional world and are exchanged in real time. They are used by the WMO in a diagnostic sense in enhancing the completeness, usability and efficiency of the network (through the Global Climate Observing System); they are also used in developing the afore-mentioned statistical relationships/models with other partners, and in studying climate phenomena (including feedbacks and uncertainties) to improve climate predictability (through the World Climate Research Programme).

World Meteorological Organization

May 2002

Printed in the United Kingdom by The Stationery Office Limited
7/2002 742337 19585

ISBN 0-215-00445-0

9 780215 004451

Distributed by The Stationery Office Limited and available from:

The Stationery Office
(mail, telephone and fax orders only)
PO Box 29, Norwich NR3 1GN
General enquiries 0870 600 5522
Order through the Parliamentary Hotline *Lo-call* 0845 7 023474
Fax orders 0870 600 5533

You can now order books online at **www.tso.co.uk**

The Stationery Office Bookshops
123 Kingsway, London WC2B 6PQ
020 7242 6393 Fax 020 7242 6394
68–69 Bull Street, Birmingham B4 6AD
0121 236 9696 Fax 0121 236 9699
9–21 Princess Street, Manchester M60 8AS
0161 834 7201 Fax 0161 833 0634
16 Arthur Street, Belfast BT1 4GD
028 9023 8451 Fax 028 9023 5401
The Stationery Office Oriel Bookshop
18–19 High Street, Cardiff CF1 2BZ
029 2039 5548 Fax 029 2038 4347
71 Lothian Road, Edinburgh EH3 9AZ
0870 606 5566 Fax 0870 606 5588

The Parliamentary Bookshop
12 Bridge Street, Parliament Square
London SW1A 2JX
Telephone orders 020 7219 3890
General enquiries 020 7219 3890
Fax orders 020 7219 3866

The Stationery Office's Accredited Agents
(see Yellow Pages)

and through good booksellers

© Parliamentary Copyright House of Commons 2002
Applications for reproduction should be made in writing to the Copyright Unit,
Her Majesty's Stationery Office, St Clements House, 2–16 Colegate, Norwich NR3 1BQ
– Fax 01603 723000

ISBN 0 215 00445 0